WX2300-UM-251

SERVICE MANUAL AND PARTS LIST for X-Y RECORDER model WX2300

GRAPHTEC CORP.
TOKYO,JAPAN

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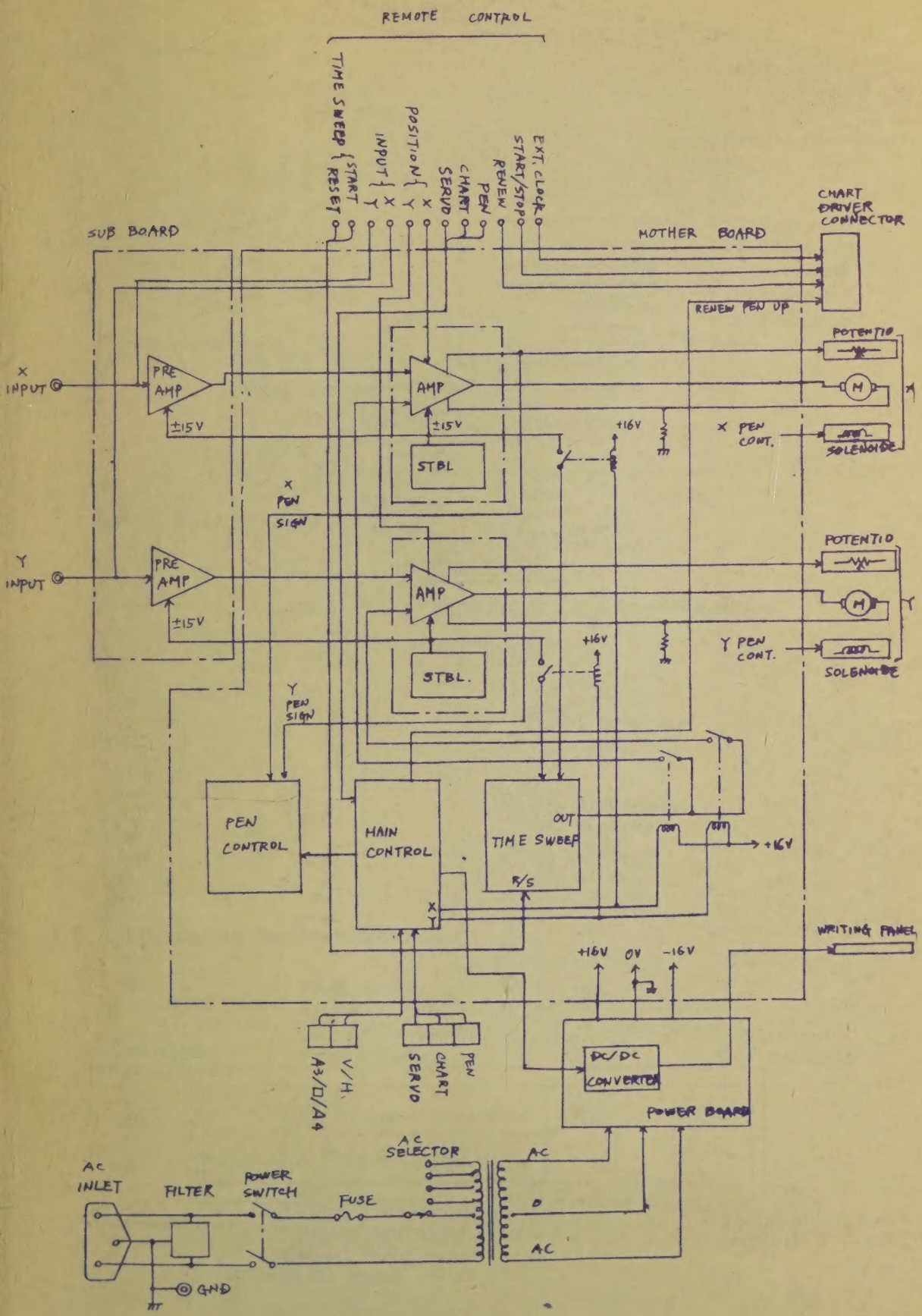
1. BLOCK DIAGRAM



2. LAYOUT AND ADJUSTMENT TRIMMERS

2.1 Bottom View

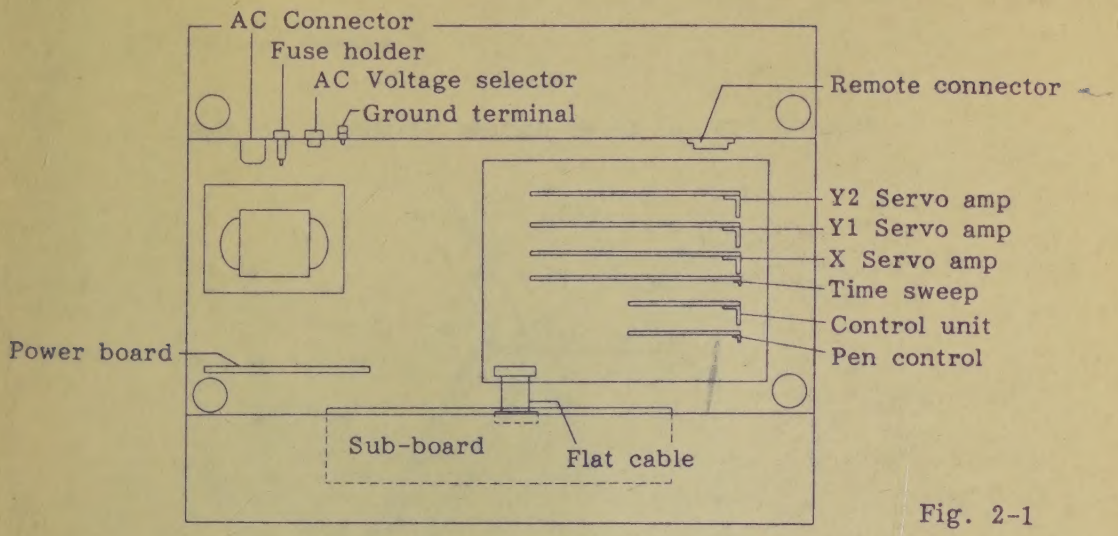


Fig. 2-1

2.2 Bottom Plate Section

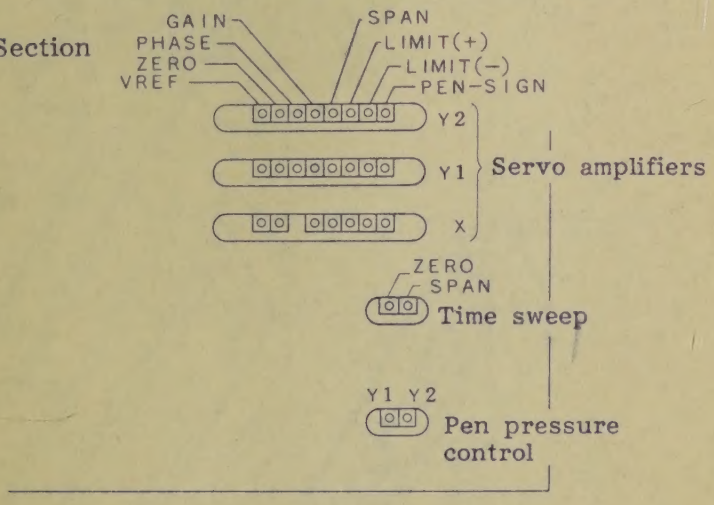


Fig. 2-2

2.3 Operating Section Front View

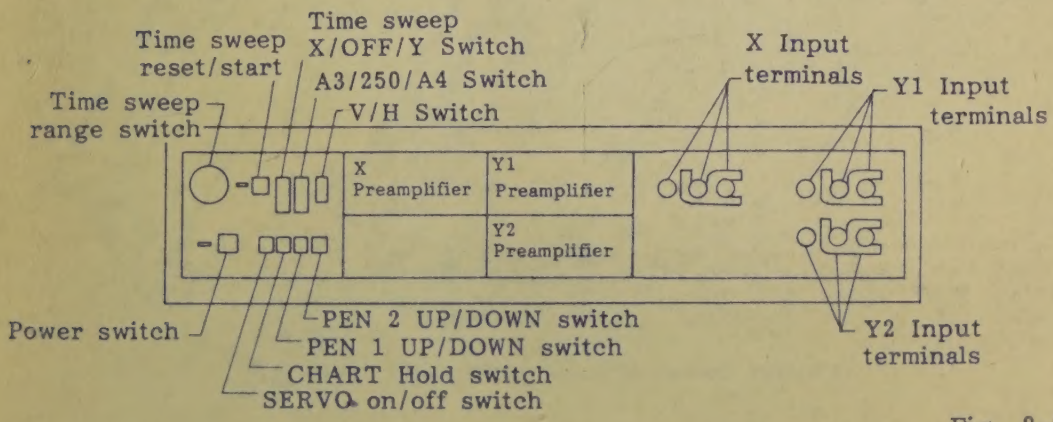


Fig. 2-3

3. DISASSEMBLY AND ASSEMBLY

3.1 Removing the Operating Section Cover (Fig. 3-1)

1 Remove screws A.

2 Pull the operating section cover upward sharply.

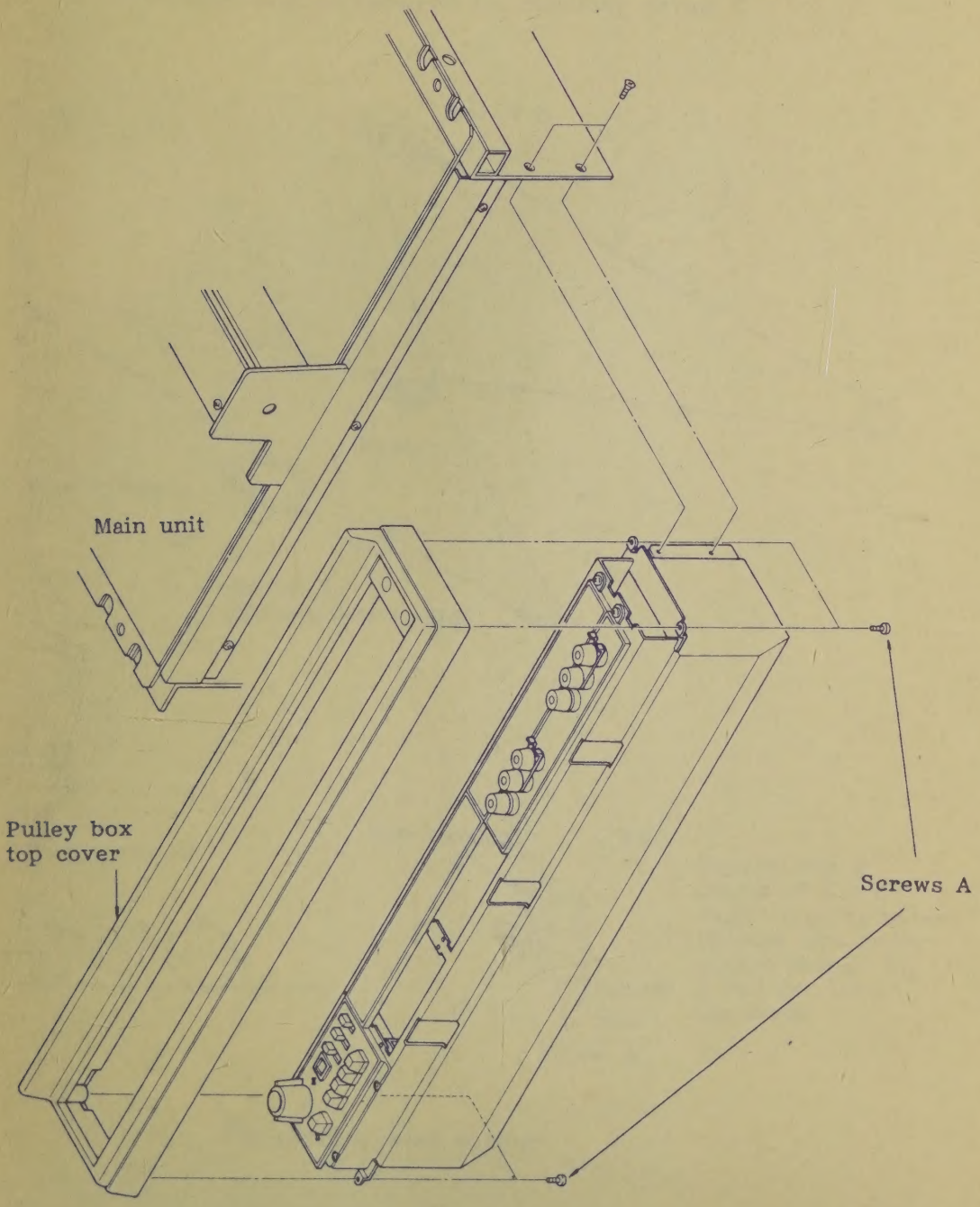


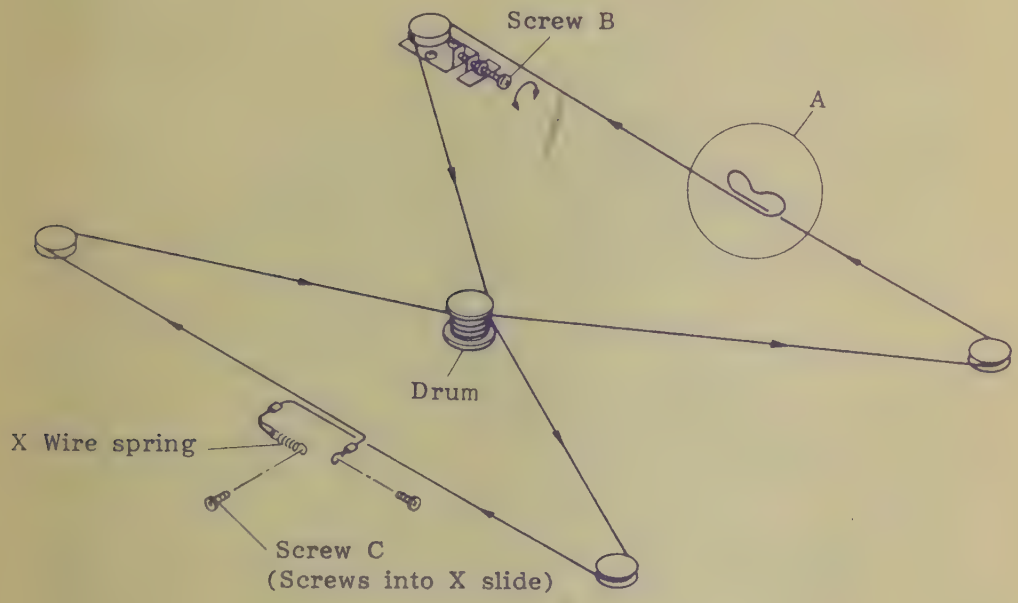
Fig. 3-1 Operating section cover removal

3.2 X-Axis Wiring (Fig. 3-2)

1 Turn screw A counterclockwise to loosen.

2 Turn screw B counterclockwise to loosen the wire tension.

3 The wire may be removed by removing screw C.



Section A

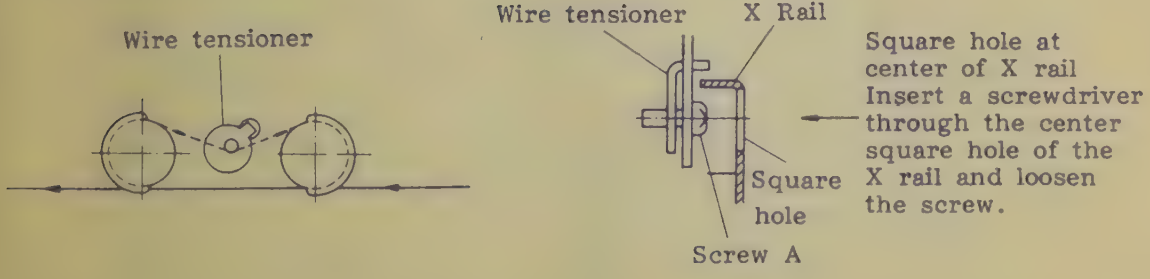

Wire tensioner
Wire tensioner
X Rail
Square hole at center of X rail Insert a screwdriver through the center square hole of the X rail and loosen the screw.
Square hole
Screw A

Fig. 3-2 X-Axis wiring

3.3 Y-Axis Wiring

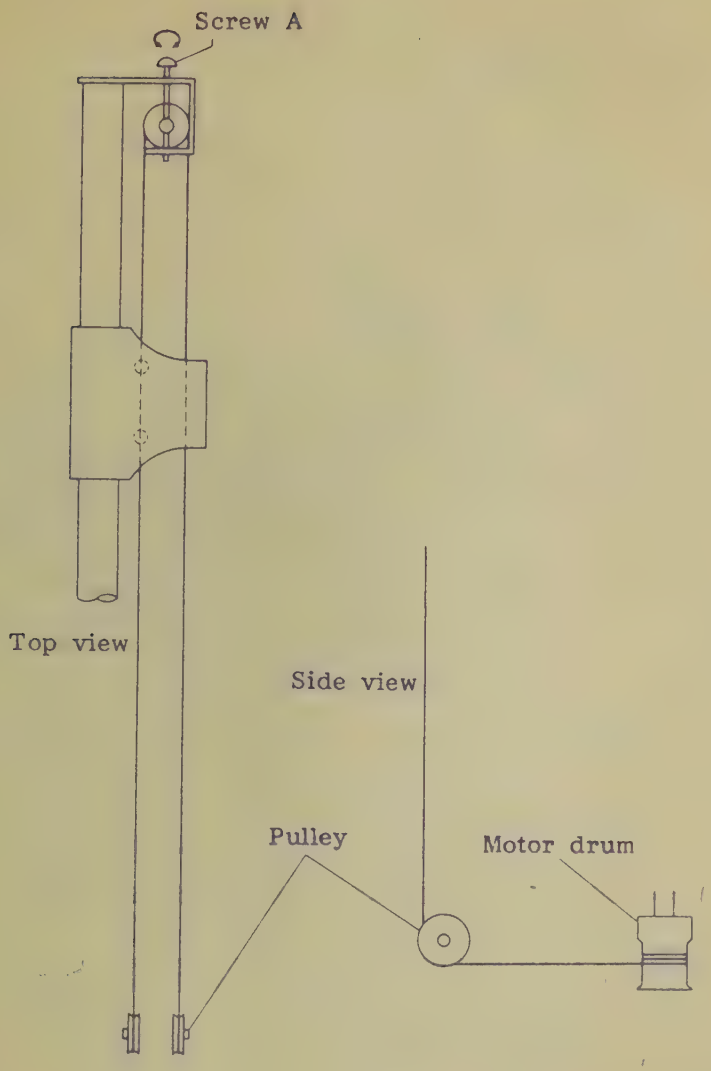


Fig. 3-3 Y-Axis wiring

3.4 Recording Paper Feed Unit Mounting

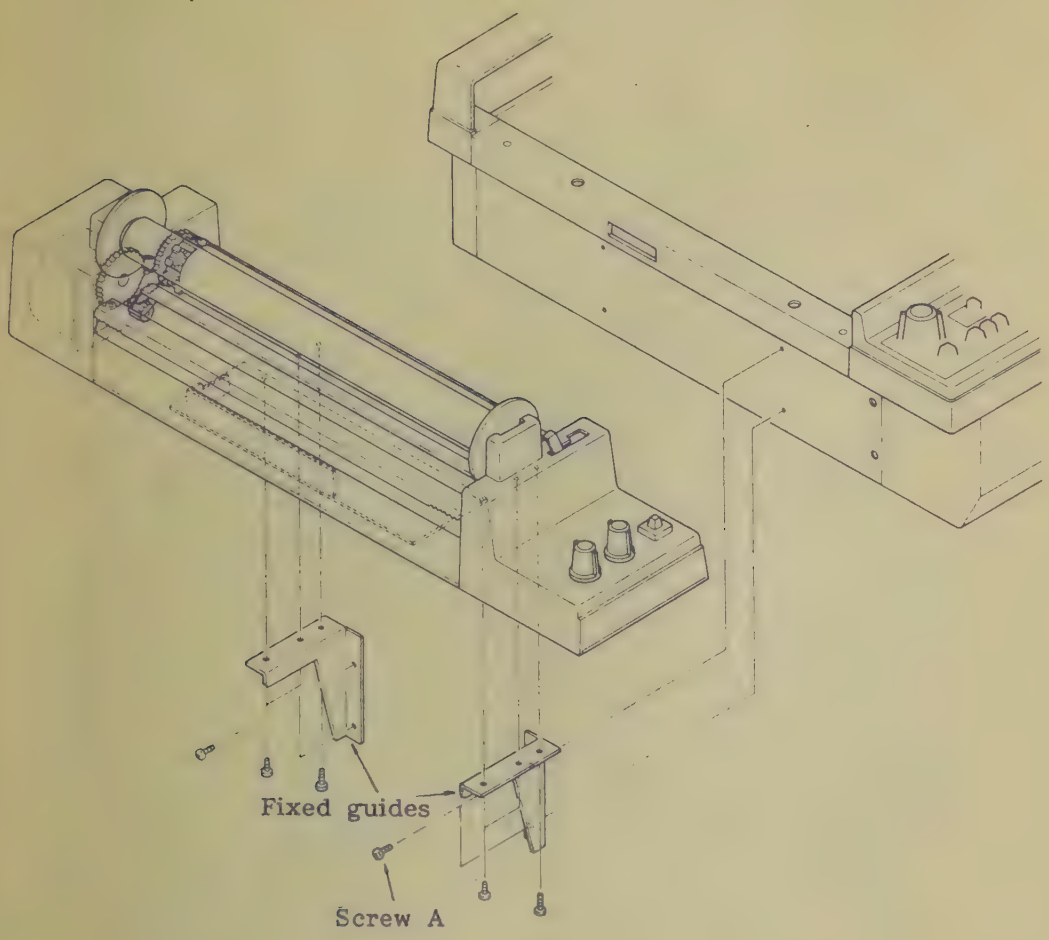


Fig. 3-4 Recording paper feed unit mounting

3.5 Removing the Recording Paper Feed Unit Cover

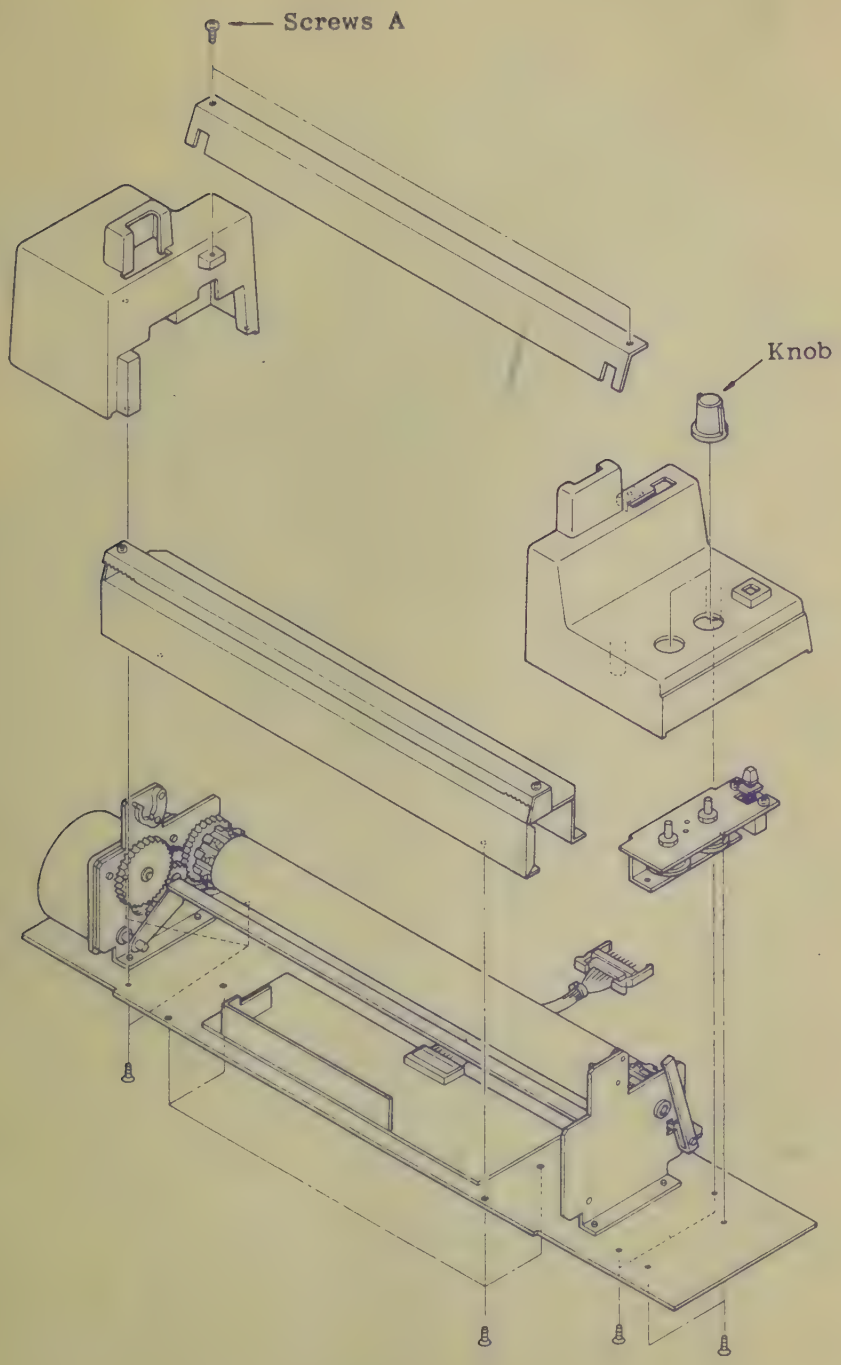


Fig. 3-5 Removing the recording paper feed unit cover

4. ADJUSTMENT

4.1 Wire Tension

4.1.1 X Axis

1 Remove the paper holding plate.

2 Move the X slide to the right side (towards the plus edge).

3 With the X slide at the approximate center between the two pulleys, as shown in Fig. 4-1, press the wire with a tension gauge. 4mm deflection corresponds to approximately 100g of tension.

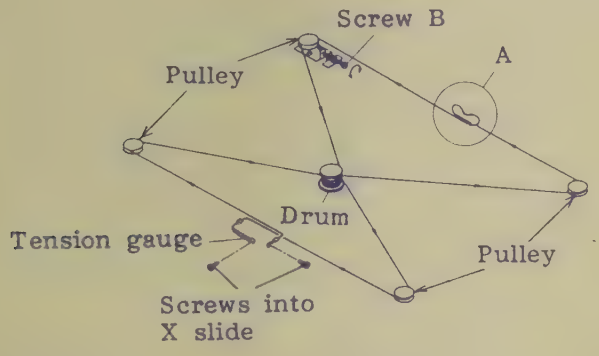


Fig. 4-1

4 If the wire tension was incorrect, loosen screw A and turn screw B in the clockwise direction to increase the tension. After making this tension adjustment, lock screw B using the nut so that the tension does not change.

Measure the tension once again after moving the X slide back and forth several times.

5 Check the perpendicularity (see Fig. 4-2).

6 Tighten screw A to hold the wire.

4.1.2 Y Axis

1 Remove the Y slide scale plate.

2 Move the Y slide forward (towards the minus edge).

3 With the Y slide at the approximate center position, press the wire with a tension gauge as shown in Fig. 4-2. For single-pen recorders, a tension of 30 ∿ 35g (corresponding to a deflection of 5mm) is proper. For two-pen recorders, a tension of approximately 28g (corresponding to a deflection of 4mm) is proper.

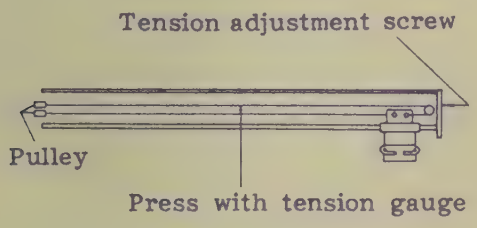


Fig. 4-2

4 If the wire tension was incorrect, adjust using the tension adjustment screw. Turn the screw in the clockwise direction to increase tension.

Measure the tension once again after moving the Y slide back and forth several times.

4.2 Perpendicularity

1 Remove the paper holding plate.

2 Move the X slide to the left side (minus edge).

3 Using the edge of the recorder as a reference, loosen screw A shown in Fig. 4-3 and fine adjust the Y axis angle so that the Y axis is parallel to the recorder edge.

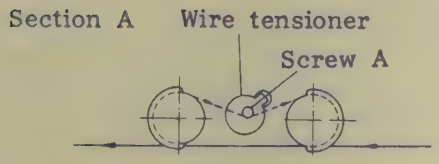


Fig. 4-3

4 After adjustment, tighten screw A securely.

4.3 Pen Pressure

The solenoid pull-in force applies the pen pressure.

1 Set the V/H switch on the recorder operating panel to the VERT position.

2 Turn pen pressure adjustment trimmers R40 and R39 so that the voltages on the pen 1 check terminal TB3 and pen 2 check terminal TB5 are as follows.

Pen 1 (TB3)	Approx. 2.8V	VERT Setting
Pen 2 (TB5)	Approx. 4.2V	

When making this adjustment, verify that the pen pressure is 26g±4g.

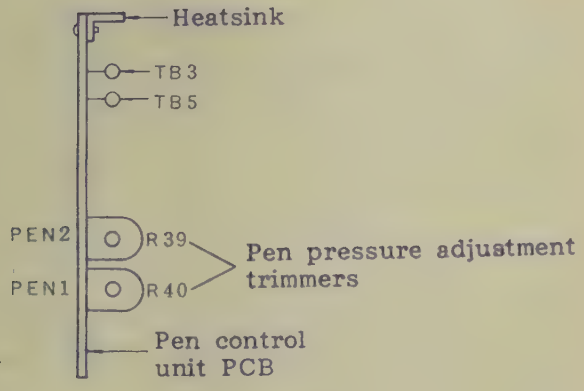


Fig. 4-4

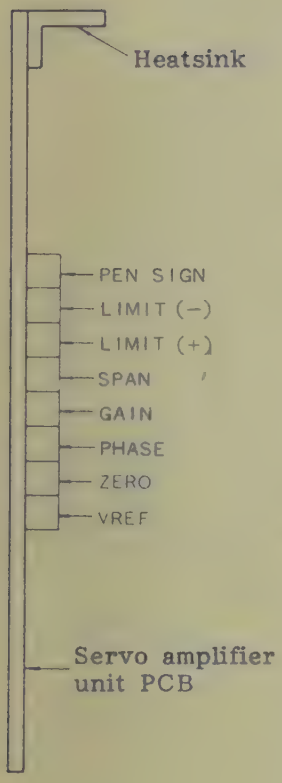
4.4 Servo Amplifier (Fig. 4-5)

This adjustment is made with the preamplifiers removed and replaced by a preamplifier shorting board. The PHASE adjustment, however, is easier to make with the preamplifiers inserted.

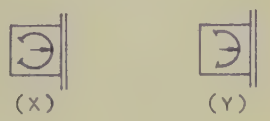
V_{REF} (R66)

1 Adjust the V_{REF} trimmer so that the voltages on the servo amplifier board jumpers J1 (+15V) and J2 (-15V) are +15V±0.2% and -15V±0.2%, respectively. Turning the trimmer in the clockwise direction increases the voltage.

Measurement of ±15V can be made at the mother board connector or preamplifier connector.



2 Set the GAIN trimmers to the approximate positions shown below.



ZERO (R67)

3 Mount a sheet of recording paper and, with an input voltage of 0V, adjust the ZERO trimmer so that the pen is in the center of the recording paper scale.

Fig. 4-5

PEN SIGN (R73) 4 PEN SIGN

SPAN (R70) 5 Apply an input voltage and adjust the SPAN trimmer so that the pen deflects to full scale. Turning the trimmer in the clockwise direction increases the span.

X:	±3.8V for ±190mm deflection	0.2V/cm
Y:	±2.5V for ±125mm deflection	sensitivity

LIMIT (R71,72) 6 Increase the input voltage and adjust the electronic limiter.

GAIN (R69) 7 Verify that the deadband is no greater than ±0.1% (0.2% peak-to-peak) of full scale.

X: 0.76mm or less
Y: 0.5mm or less

If the deadband is excessive, turn the trimmer in the clockwise direction to increase the gain.

CAUTION

- When changing the GAIN adjustment, the zero and span adjustments will change slightly, requiring readjustment.
- Even if the ZERO adjustment is changed, the gain and span adjustments will not change, although the electronic limit point will shift.
- Changing the SPAN adjustment does not cause changes in the zero and gain.

PHASE (R68)

8 Insert the preamplifiers (with the filter set at 0dB).

9 Apply a full scale 0.3Hz sinewave to both X and Y axes (with the same sensitivity set for both axes).

10 With the frequencies increased as shown below, adjust the PHASE trimmer so that the reciprocating lines on the recording paper are no more than 0.4mm apart (Fig. 4-6).

1-Pen recorder: 1.2Hz (rated frequency 1Hz)
2-Pen recorder: 0.7Hz (rated frequency 0.6Hz)

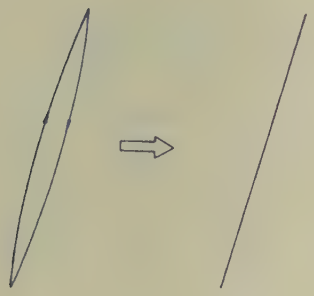


Fig. 4-6

4.5 Time Sweep (Fig. 4-7)

ZERO (R22)

1 With the time sweep in the reset condition, adjust the ZERO trimmer (R22) so that the voltage between check terminals TB2 and TB4 is 0V±15mV.

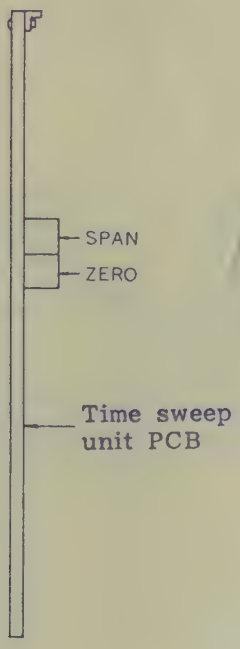


Fig. 4-7

SPAN (R21)

2 With SERVO set to OFF, short terminals TB2 and TB5. In this condition, adjust the SPAN trimmer (R21) so that the voltage between terminals TB2 and TB4 is 8.19V. The pen tip adjustment should be made as follows.

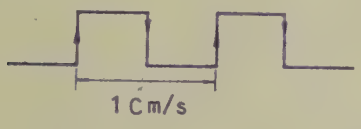
3 Adjust the ZERO trimmer so that the pen position does not change when the operating panel X/OFF/Y switch is switched from OFF to X or Y.

4 Set the X/OFF/Y switch to X or Y.

5 Set the RANGE switch to 1cm/s.

6 Start the sweep and apply a low-amplitude squarewave (approx. 5mm) to the opposite axis.

7 Press the RESET/START switch to start the sweep. Adjust the SPAN trimmer so that the period of the squarewave is 1cm.



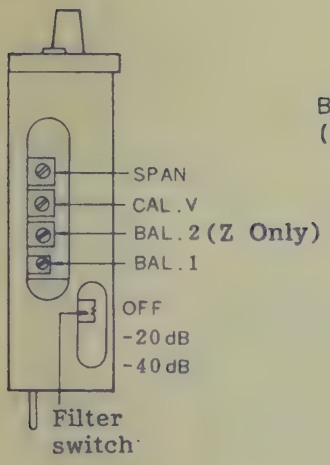
CAUTION

o Time sweep speed adjustment assumes that the servo amplifier sensitivity is correct (when making adjustment using the pen tip position as a guide).

4.6 Preamplifier (Z)

1 Set all trimmers to the approximate center position.

2 Set the MEAS/OFF switch to OFF and the mV/V switch to mV.



BAL. 1 (R9)

3 Adjust the BAL.1 trimmer so that the pen position at maximum sensitivity is the same as the position at minimum sensitivity.

4 Connect a resistance of 10kΩ ∿ 20kΩ across the (+) and (-) input terminals.

Fig. 4-8

BAL. 2 (R5)

5 Adjust the BAL.2 trimmer so that when the MEAS/OFF switch is set to MEAS, the pen position is the same as it is when the switch is set to OFF.

6 Set the sensitivity to 0.1V/cm.

SPAN (R21)

7 Use the position adjustment to set the zero position and apply a full scale voltage (remove the resistance from between the (+) and (-) input terminals).

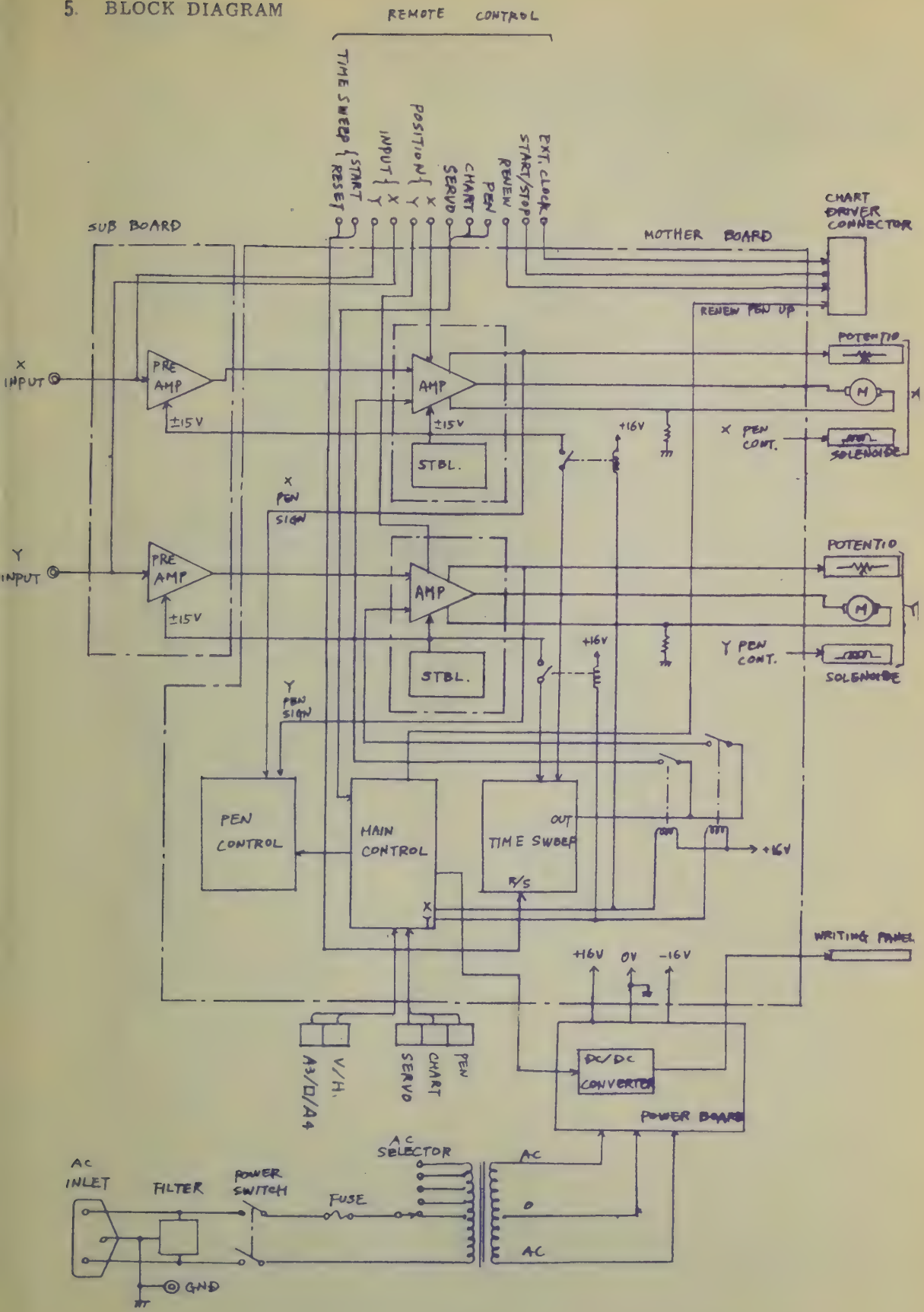
Adjust the SPAN trimmer for full scale deflection. Turning the trimmer in the clockwise direction widens the span (set the GAIN control to the fully clockwise position).

8 Set the MEAS/OFF switch to OFF.

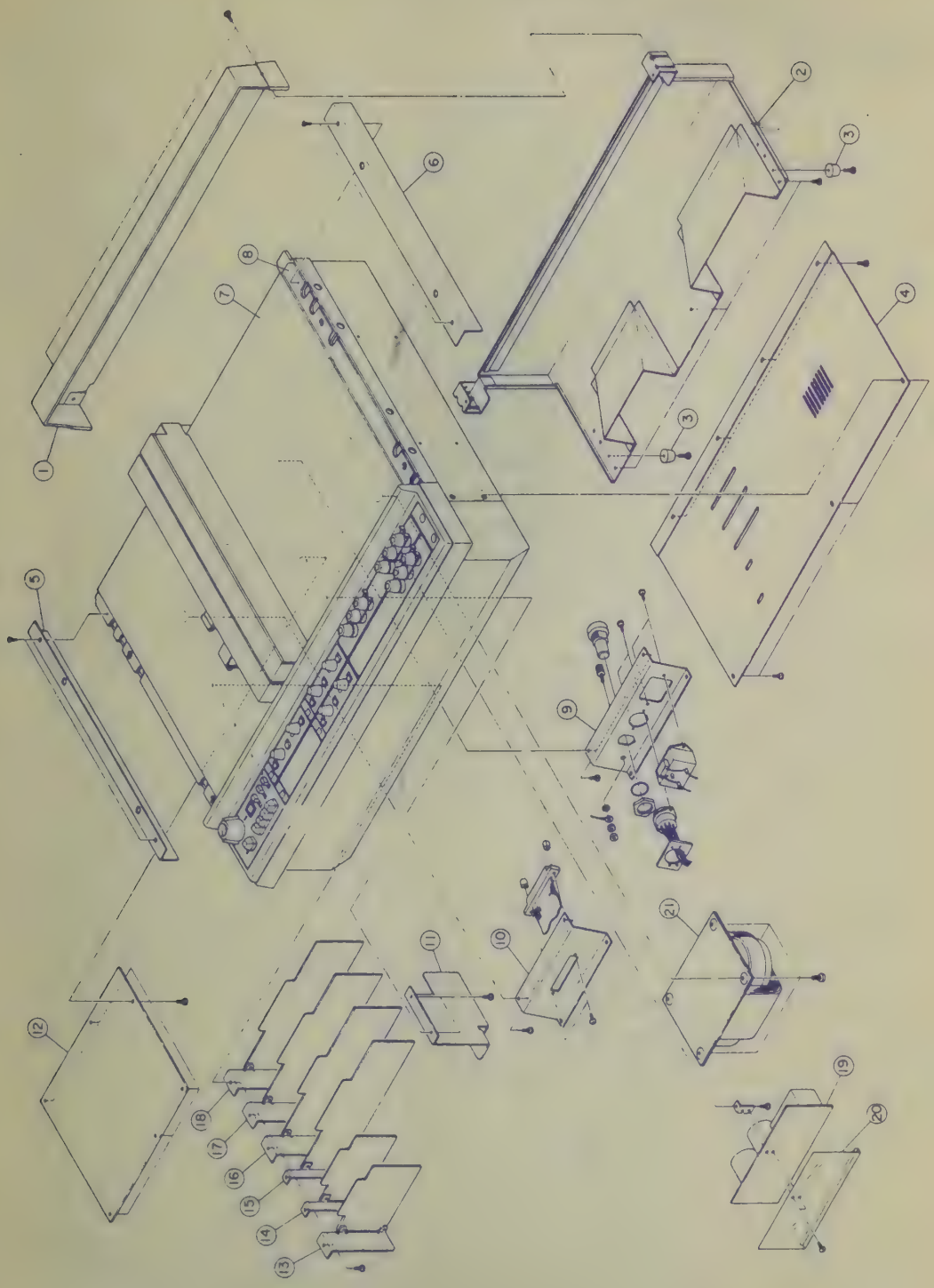
CAL. V (R34)

9 Adjust the CAL.V trimmer so that the pen deflects 10cm when the CAL.V switch is set to ON.

5. BLOCK DIAGRAM



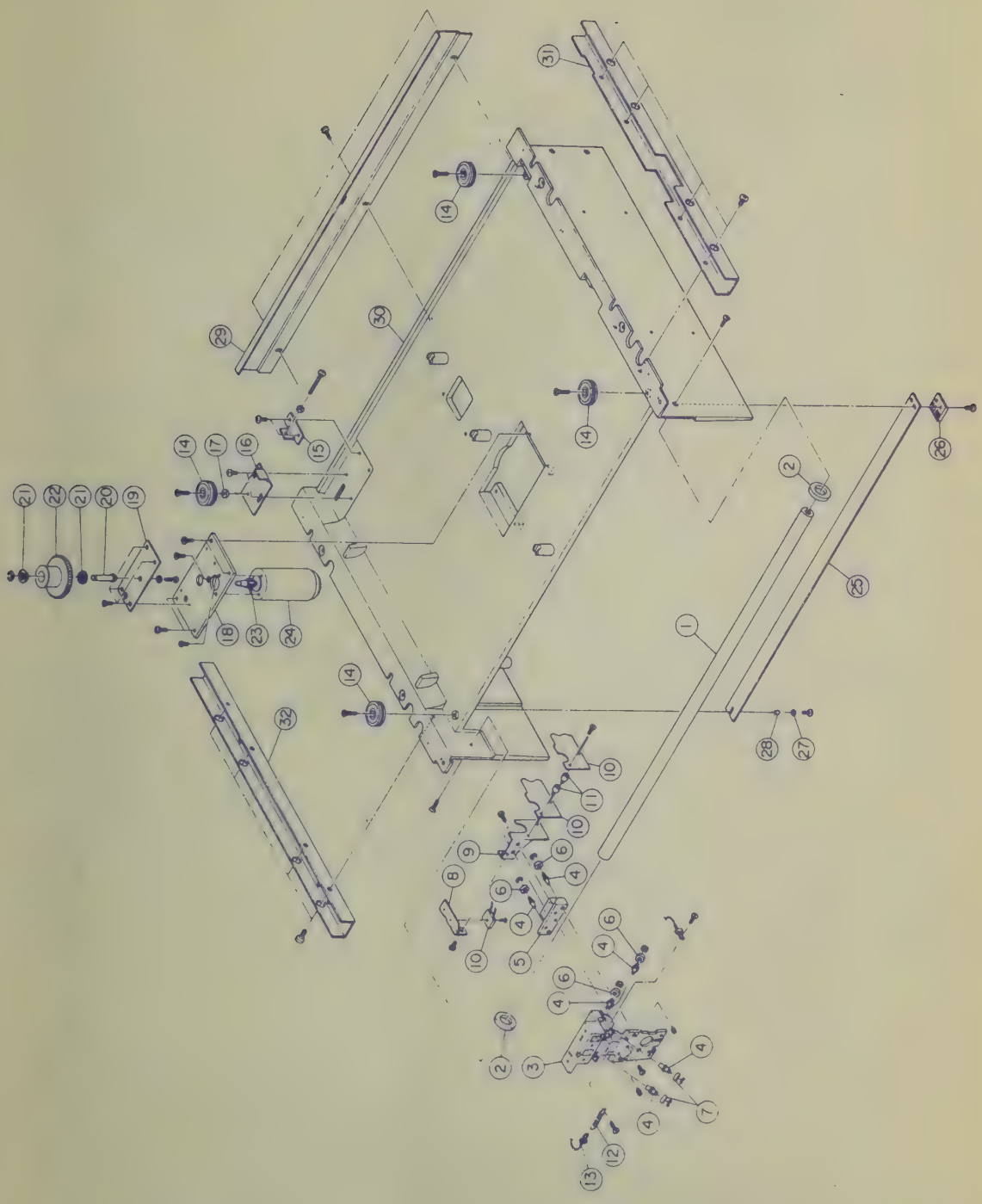
5 – 1 Mainframe



Main Frame

Item	Part No.		Description	Q'ty	Remarks
1	023005010		Upper Cover	1	
2	023005022		Lower Cover	1	
3	366311030		Cushion, K-23	2	
4	023005101		Bottom Cover	1	
5	023005112		Ornamental Panel-L	1	
6	023005121		Ornamental Panel-R	1	
7	043000923		Writing Panel	1	
8	723000310		Base Plate	1	
9	023000102		Support, Power Connector	1	
10	023000111		Support, Remote Connector	1	
11	023000041		Holder, PCB	1	
12			Mother Board	1	
13			Pen Control Unit	1	
14			Control Unit	1	
15			Time Sweep Unit	1	
16			Servo Amplifier (X-axis)	1	
17			Servo Amplifier (Y-axis)	1	1 Pen Type
			Servo Amplifier (Y_1-axis)	1	2 Pen Type
18			Servo Amplifier (Y_2-axis)	1	2 Pen Type
19			Power Board	1	
20	023000151		Insulator	1	
21	510230010		Transformer	1	

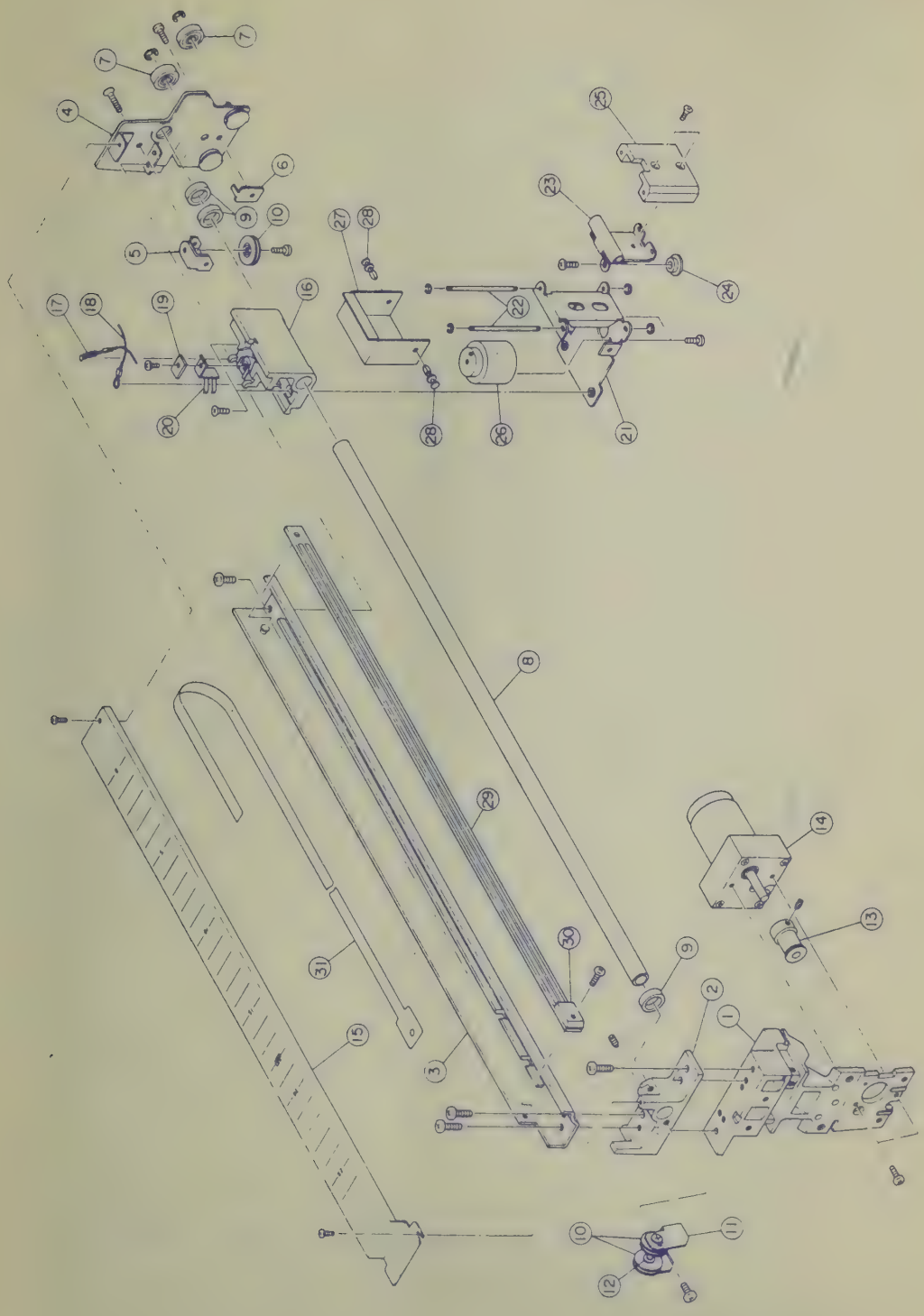
5 – 2 X-Axis Servo Mechanism



X-axis Servo Mechanism

Item	Part No.		Description	Q'ty	Remarks
1	023003011		Shaft, X	1	
2	023003021		Cushion	2	
3	023003043		Carriage, X	1	
4	023003051		Shaft, Bearing	6	
5	023003071		Block	1	
6	310804001		Bearing, SMR84ZZ	6	
7	023003101		Support, Contact	1	
8	023003111		Support, FPC	1	
9	744413550		Contact	1	
10	511430190		FPC-533-C	1/CH	
11	023003122		Screw, Spacer	2	For 2 Pen Type
12	023003151		Spring, X Wire	1	
13	023003162		Wire, X	1	
14	046350030		Guide Pulley	4	
15	023003130		Adjuster-A	1	
16	023003141		Adjuster-B	1	
17	023003180		Spacer	1	
18	023006011		Support, Servo Motor	1	
19	023006021		Plate	1	
20	023006030		Shaft, Drive Pulley	1	
21	311005110		Bearing MF105ZZS	2	
22	023006111		Drive Pulley (1 Pen)	1	For 1 Pen Type
	023006211		Drive Pulley (2 Pen)	1	For 2 Pen Type
23	040013311		Pinion (1 Pen)	1	For 1 Pen Type
	040013421		Pinion (2 Pen)	1	For 2 Pen Type
24	509100023		Servo Motor	1	
25	506211205		Potentiometer, X	1	
26	744413560		Terminal, Potentiometer	1	
27	044213390		Washer	1	
28	304420006		Bushing	1	
29	023000062		Guide Rail	1	
30	023000011		Main Frame	1	
31	023005132		Side Metal L	1	
32	023005152		Side Metal-R	1	

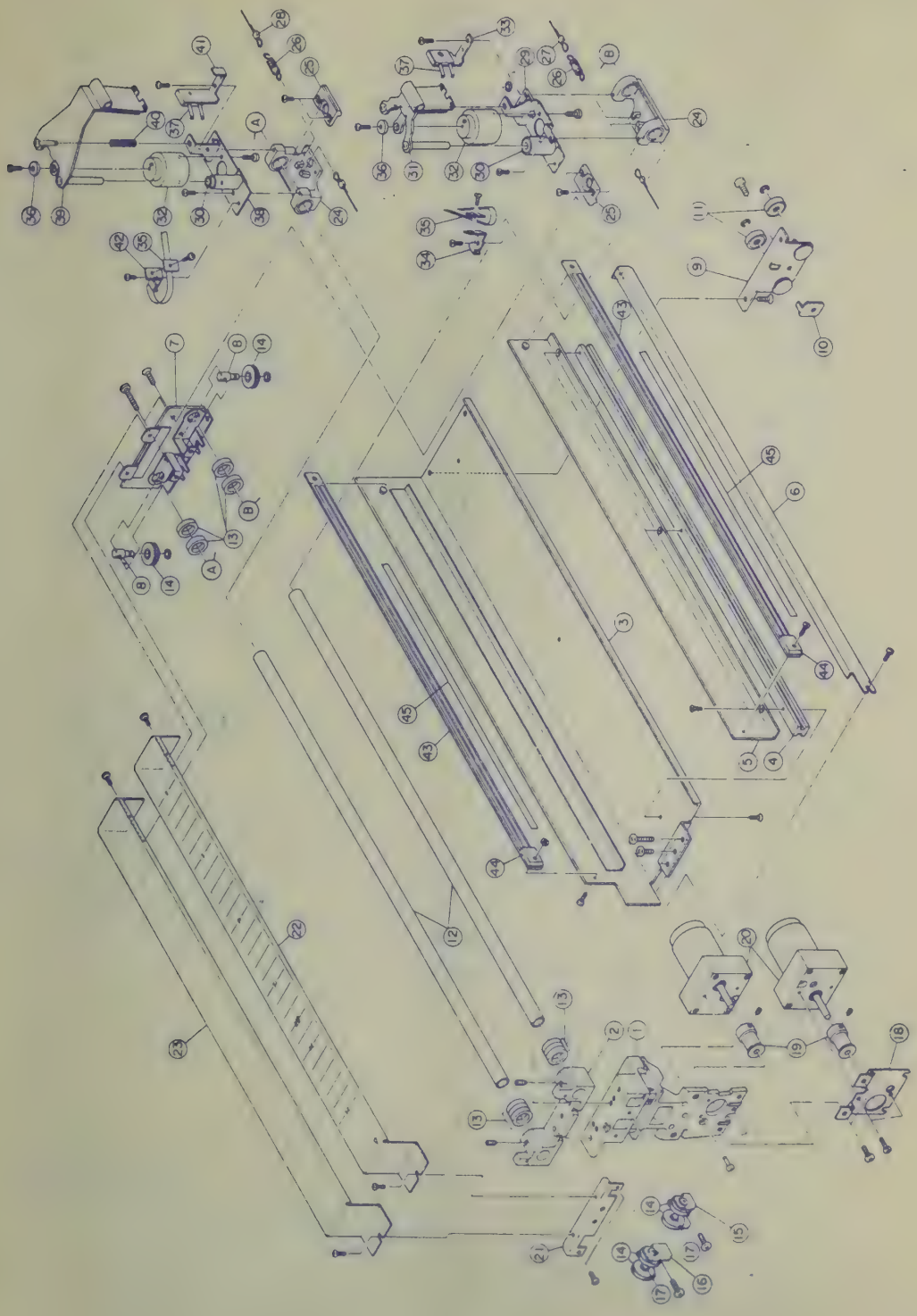
5 – 3 Y-Axis Servo Mechanism (1 Pen Type)



Y-axis Servo Mechanism (1 pen type)

Item	Part No.		Description	Q'ty	Remarks
1	023003043		Carriage, X	1	
2	023003411		Support, 1 Pen	1	
3	023003422		Y-Bar, 1 Pen	1	
4	723003432		Support, X-Roller (1 Pen)	1	
5	040014081		Adjuster	1	
6	023003270		Clamp, X Wire	1	
7	311304010		X-Roller	2	
8	023003321		Shaft, Y	1	
9	023003341		Cushion	3	
10	351204001		Pulley Guide Y	3	
11	023003491		Support, Pulley Guide Y	1	
12	044413311		Nut, Pulley Guide Y	2	
13	023003330		Drive Pulley	1	
14	740016002		Y Gear Box	1	
15	023003470		Bar, Y Scale	1	
16	040014042		Pen Carriage	1	
17	040014060		Spring, Y-axis	1	
18	023003500		Wire, Y	1	
19	040014610		Plate, Cable	1	
20	040014070		Contact, Y	1	
21	040014132		Base, 1 Pen	1	
22	040014140		Shaft, 1 Pen Slider	2	
23	040014150		Holder, 1 Pen	1	
24	040014160		Spacer, 1 Pen	1	
25	044314770		Slider	1	
26	740014000		Solenoid	1	
27	040014190		Pen Cover	1	
28	304500001		Rivet 3x3.5	2	
29	506211203		Potentiometer, Y	1	
30	744413560		Terminal, Potentiometer	1	
31	043003440		A3 YFPC	1	

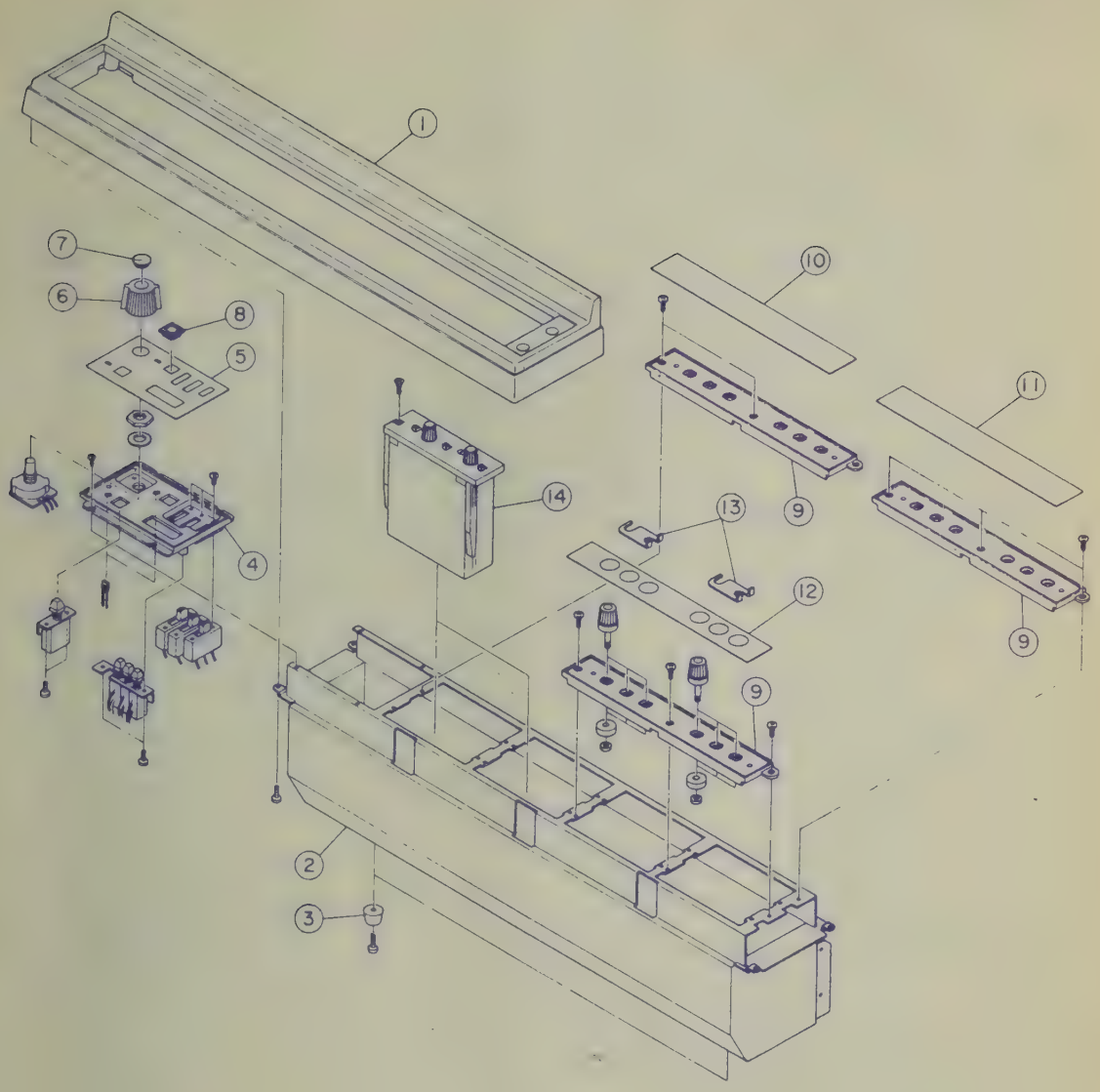
5 – 4 Y-Axis Servo Mechanism (2 Pen Type)



Y-axis Servo Mechanism (2 pen type)

Item	Part No.		Description	Q'ty	Remarks
1	023003043		Carriage, X	1	
2	023003611		Support, 2 Pen	1	
3	723003622		Y-Bar, 2 Pen	1	
4	023003651		Guide Rail	1	
5	023003660		Support, Potentiometer	1	
6	023003671		Guide, FPC	1	
7	723003681		Support, Shaft Y	1	
8	023003731		Shaft, Pulley Guide Y	2	
9	723003742		Support, X-Roller (2 Pen)	1	
10	023003270		Clamp, X Wire	1	
11	311304010		X-Roller	2	
12	023003321		Shaft, Y	2	
13	023003341		Cushion	10	
14	351204001		Pulley Guide Y	6	
15	023003831		Support-Y1, Pulley Guide Y	1	
16	023003841		Support-Y2, Pulley Guide Y	1	
17	044413311		Nut, Pulley Guide Y	4	
18	023003851		Support, Y Gear Box	1	
19	023003330		Drive Pulley	2	
20	740016002		Y Gear Box	2	
21	023003881		Support, Y Scale Bar	1	
22	023003810		Bar, Y Scale	1	
23	023003821		Bar, Y	1	
24	723003761		Pen Carriage (2 Pen)	2	
25	023003801		Slider	2	
26	040014060		Spring, Y-axis	2	
27	023003861		Wire, Y_1	1	
28	023003500		Wire, Y	1	
29	723004111		Base, 1 CH	1	
30	310804020		Bearing	2/CH	
31	723004152		Pen Arm, 1 CH	1	
32	740014000		Solenoid	1/CH	
33	023004191		Support, Contact (1 CH)	1	
34	023004201		Support, A3YFPC (1 CH)	1	
35	040014210		Plate, Cable	1/CH	
36	023004042		Spacer, 2 Pen	1/CH	
37	744413550		Contact	1/CH	
38	723004311		Base, 2 CH	1	
39	723004342		Pen Arm, 2 CH	1	
40	023004391		Spring, Pen Arm	1	
41	023004402		Support, Contact (2 CH)	1	
42	023004411		Support, A3YFPC (2 CH)	1	
43	506211203		Potentiometer, Y	2	
44	744413560		Terminal, Potentiometer	2	
45	043003440		A3 Y FPC	2	

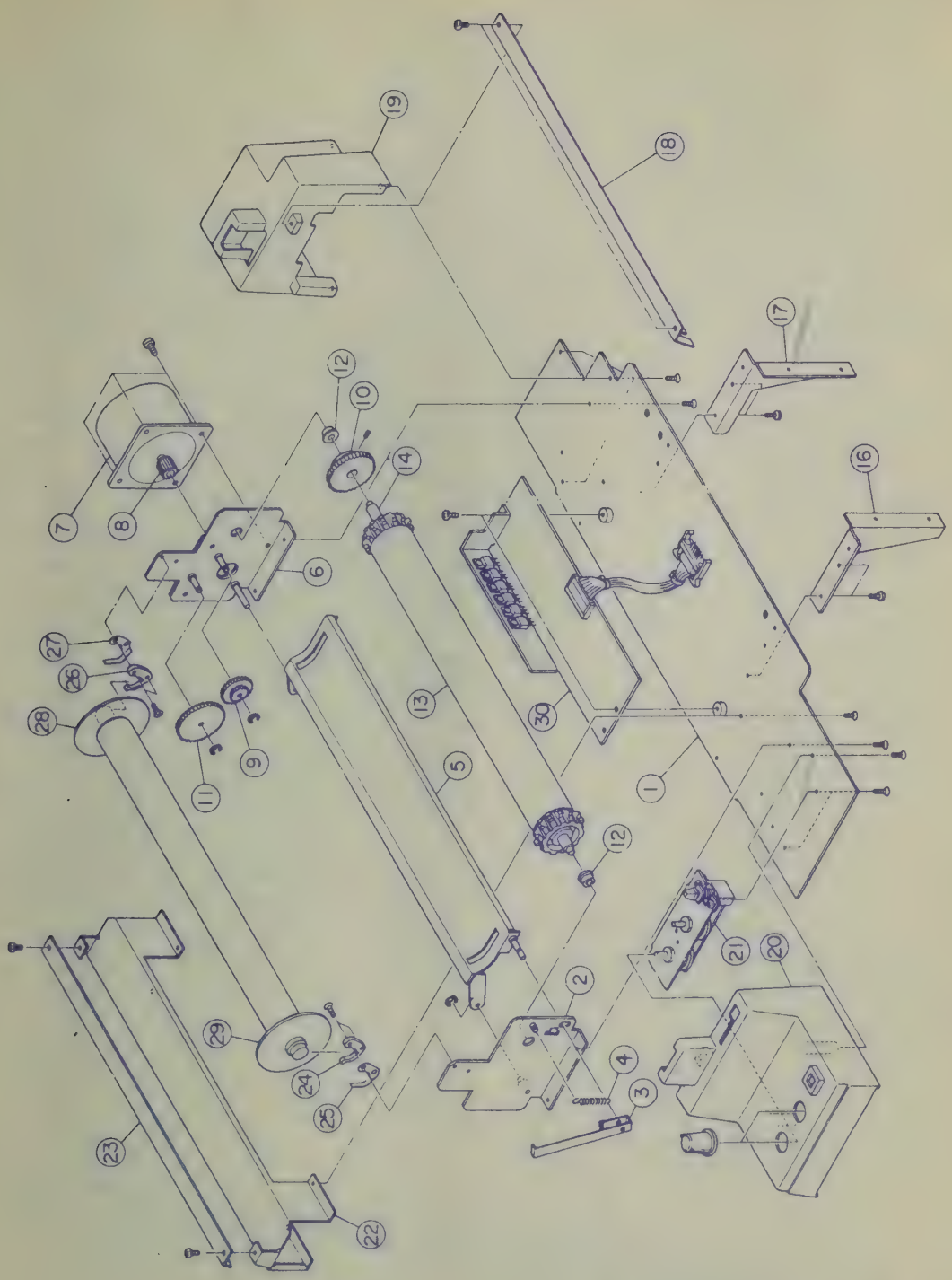
5 – 5 Preamplifier Box



Pre Amplifier Box

Item	Part No.		Description	Q'ty	Remarks
1	023007111		Upper Cover, Box	1	
2	723007122		Box	1	
3	366311030		Cushion, K-23	2	
4	023007041		Base, Control Panel	1	
5	023007301		Control Panel (1 Pen)	1	For 1 Pen Type
	023007401		Control Panel (2 Pen)	1	For 2 Pen Type
6	516100028		Knob	1	
7	516100029		Cap	1	
8	508201007		Rim	5 6	- - - 1 Pen Type - - - 2 Pen Type
9	023007050		Base, Control Panel	3 2	- - - 1 Pen Type - - - 2 Pen Type
10	023007361		Blind Panel	1	1 Pen Type
11	023007361		Blind Panel	1	1 Pen Type
	023007461		Terminal Panel, Y_1	1	2 Pen Type
12	023007331		Terminal Panel, Y	1	1 Pen Type
	023007471		Terminal Panel, Y_2	1	2 Pen Type
13	004407010		Short Bar	2 3	- - - 1 Pen Type - - - 2 Pen Type
14			Pre Amplifier	2 3	- - - 1 Pen Type - - - 2 Pen Type

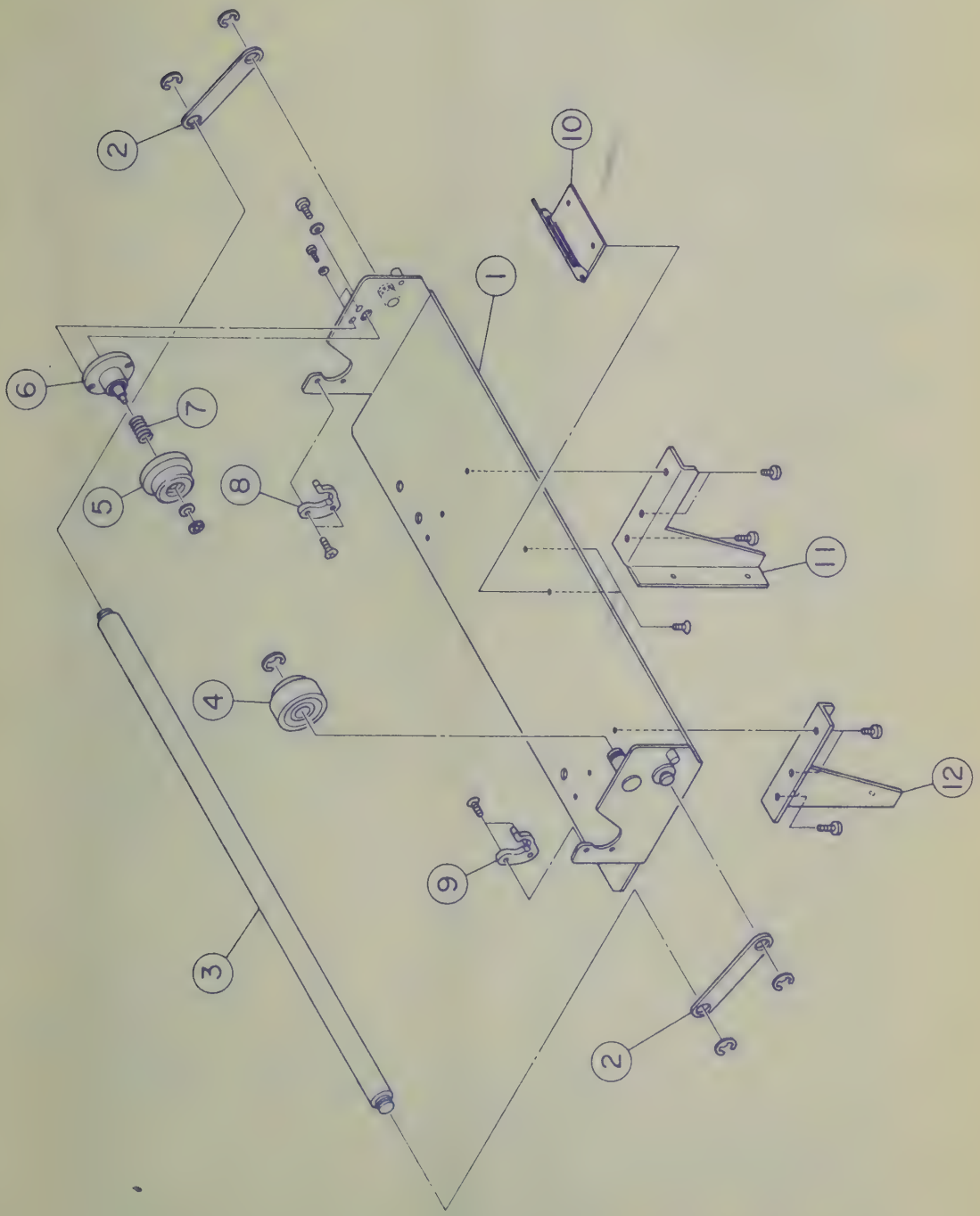
5 – 6 Take-Up Mechanism



ake Up Mechanism

em	Part No.		Description	Q'ty	Remarks
1	723002110		Base Plate	1	
2	723002132		Side Plate	1	
3	023002190		Lever	1	
4	043012350		Spring, Chart Guide	1	
5	743012231		Chart Guide	1	
6	723002151		Back Plate	1	
7	509400004		Stepping Motor	1	
8	043012410		Pinion	1	
9	743012420		Gear Ass'y	1	
10	043012450		Gear-C	1	
11	043012460		Gear-D	1	
12	320705001		Bearing	2	
13	043012470		Pipe	1	
14	043012481		Shaft	1	
15	023002260		Sprocket	2	
16	023002270		Support-A	1	
17	023002280		Support-B	1	
18	023002200		Guide, Chart	1	
19	023002210		Cover, Motor	1	
20	023002220		Cover, Switches	1	
21	023002180		Support, Switches	1	
22	023002170		Cover, PCB	1	
23	023002240		Cutter	1	
24	004402120		Holder-A, Roller	1	
25	045532380		Spring, Holder-A	1	
26	004402130		Holder-B, Roller	1	
27	045532390		Spring, Holder-B	1	
28	743012542		Flange-A	1	
	043012580		Gear E	1	
	043012590		Washer	1	
	743012600		Shaft, Gear E	1	
	043012630		Spring	1	
	043012520		Screw	1	
	004402310		Roller	1	
29	743012642		Flange-B	1	
	043012520		Screw	1	
	004402310		Roller	1	
30			PCB, Chart Driver	1	

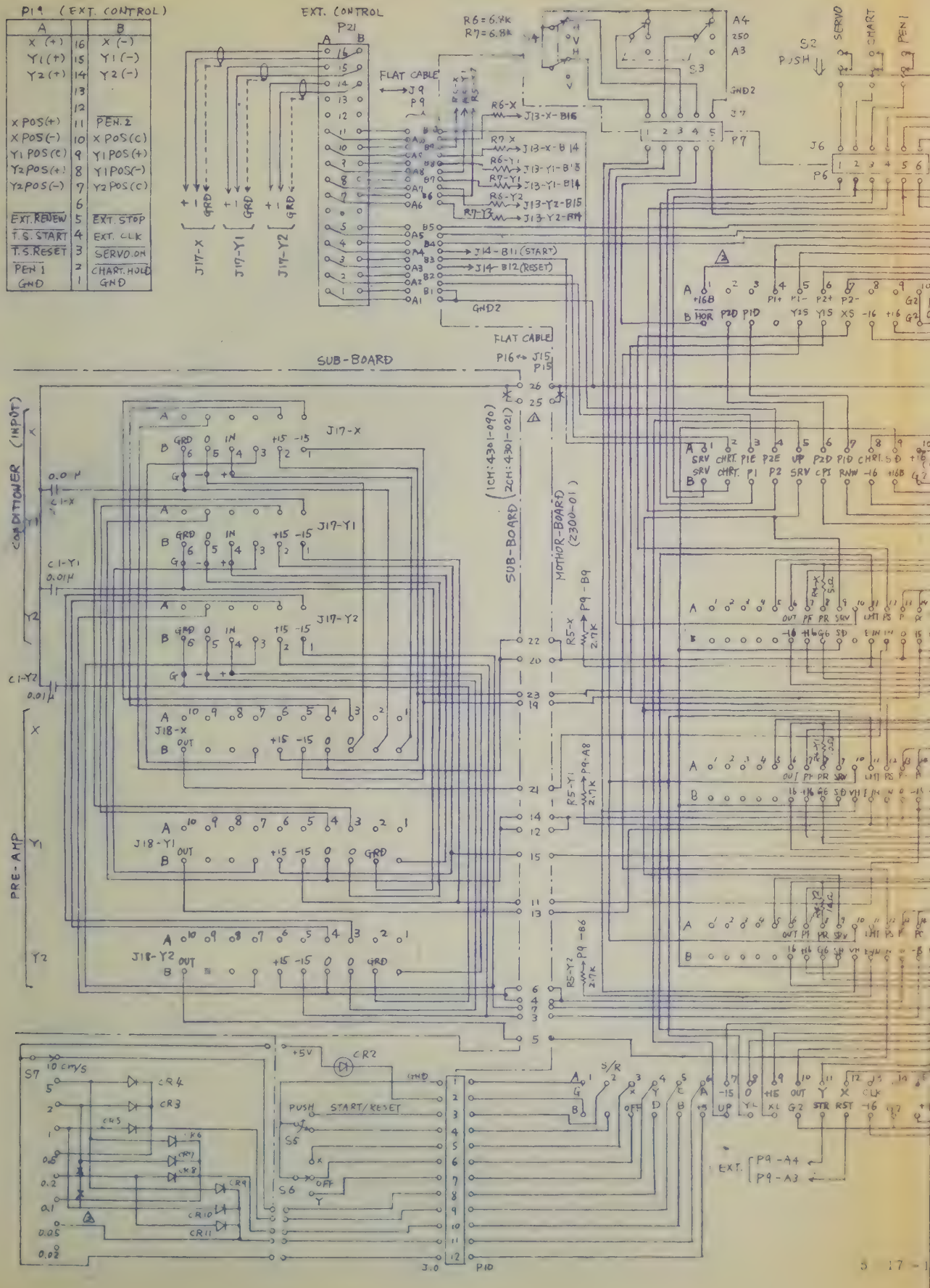
5 – 7 Roll Chart Stocker



Roll Chart Stocker

Item	Part No.		Description	Q'ty	Remarks
1	723002011		Base Plate	1	
2	023002051		Arm	2	
3	023002061		Shaft, Chart Guide	1	
4	023002071		Chart Holder-A	1	
5	023002080		Chart Holder-B	1	
6	023002091		Chart Holder-C	1	
7	023002100		Spring, Chart Holder	1	
8	004402120		Holder-A, Roller	1	
9	004402130		Holder-B, Roller	1	
10	743012702		Friction Plate	1	
11	023002270		Support-A	1	
12	023002280		Support-B	1	

5 - 8 Wiring Diagram Power /Mother/Sub Board



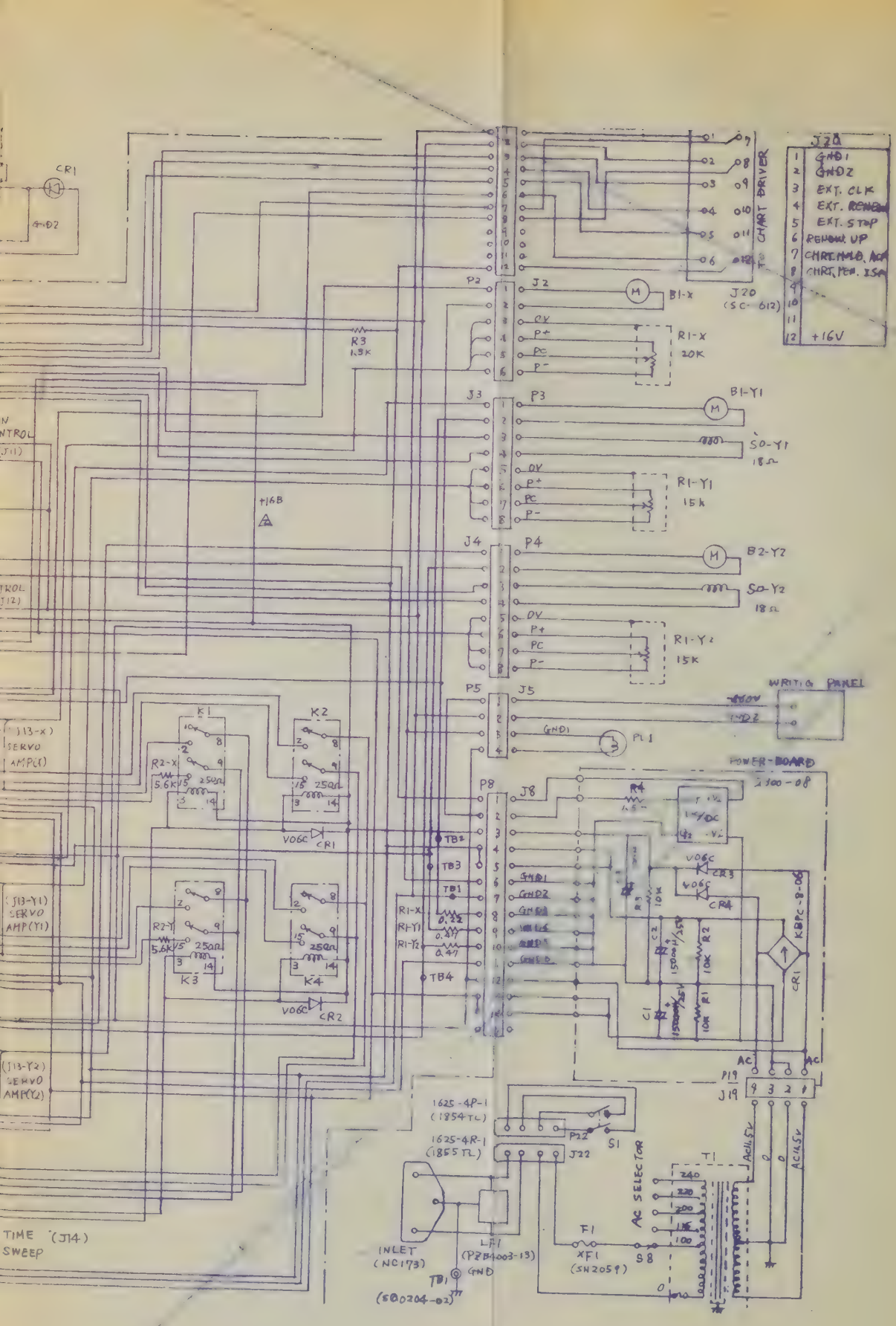

CR1
GND2
CHART DRIVER
J20
1 GND1
2 GND2
3 EXT. CLK
4 EXT. RENEW
5 EXT. STOP
6 RENEW UP
7 CHRT. MVB. ACK
8 CHRT. PEN. ISA
12 +16V
P2
J2
B1-X
J20 (SC-612)
CX
P+
PC
P-
R1-X 20K
R3 1.5K
J3
P3
B1-Y1
SO-Y1 18Ω
DY
R1-Y1 15K
+16B
J4
P4
B2-Y2
SO-Y2 18Ω
R1-Y2 15K
P5
J5
WRITING PANEL
GND1
PL1
POWER-BOARD
2500-08
P8
J8
K1
K2
K3
K4
R2-X 5.6K 1/5
R2-Y 5.6K 1/5
25Ω
VO6C
CR1
CR2
CR3
CR4
TB1
TB2
TB3
TB4
R1-X 0.22
R1-Y1 0.47
R1-Y2 0.47
R4 1.5K
R5 10K
C2 1500μF/25V
R2 10K
C1 15000μF/25V
R1 10K
KBPC-8-06
CR1
AC
P19
J19
1625-4P-1 (1854TL)
1625-4R-1 (1855TL)
P22
S1
J22
T1
240
220
200
115
100
AC115V
AC AC
AC SELECTOR
F1
XF1 (SN2059)
S8
INLET (NC173)
LF1 (PZB4003-13)
GND
TB1 (S00204-02)
(J13-X) SERVO AMP(X)
(J13-Y1) SERVO AMP(Y1)
(J13-Y2) SERVO AMP(Y2)
TIME (J14) SWEEP

Figure	Part No.	Description	Type	Remarks
W1	520100008	AC Cord	VM1165B-VM1172	
INLET	513100918	INLET	NC173	
LF1	518110007	Line Filter	PZB4003-13	
XF1	512400002	Fuse Holder	SN-2059	
F1	512300002	Fuse 2A	SM-1101-2A	100V Series
F1	512300001	" 1A	SM-1101-1A	200V Series
S1	508101010	Switch, Push AC250V, 4A	1P-0008AC1920	
S2	508201219	" "	2UE30	For WX2300-1
S2	508201220	" "	2UE40	For WX2300-2
S3	508302015	Switch, Slide	SSB023-L12R-S	
S4	508302002	" "	SSB022-L12-R-NS	
S5	508205008	Switch, Push	1F-2U0A-R7687	
S6	508302015	"	SSB023-L12R-S	
S7	507101108	"	SRM1019-15R-P	
S8	507101105	AC Selector	SJ2875-01	
CAP	516100009	Cap, Red	B101	For S1
CAP	516100020	Cap, Black	B911	For S2, S5
CAP	516100025	Cap, Ivory	B201	For S2 (Servo)
CAP	516100029	Cap, ϕ14.5mm, Black, with Line	040-362	For S7
KNOB	516100028	Knob, ϕ14.5mm, Black, with Line	023-342	For S7
T1	510230010	Transformer	WX2300	
PL1	512100004	Lamp	A71	
SOCKET	512200003	Lamp Socket	S3512	For PL1
J1	513400065	Connector, Receptacle	HNC2-2.5S-12	
CNP	513400037	Contact Pin	HNC-2.5S-A	For J1
J5	513400076	Connector, Receptacle	HNC2-2.5S-4	
CNP	513400037	Contact Pin	HNC-2.5S-A	For J5
J6	513400036	Connector, Receptacle	HNC2-2.5S-6	
CNP	513400042	Contact Pin	HNC-2.5S-B	For J6
J7	513400044	Connector, Receptacle	HNC2-2.5S-5	
CNP	513400042	Contact Pin	HNC-2.5S-B	For J7
J10	513400065	Connector, Receptacle	HNC2-2.5S-12	
CNP	513400042	Contact Pin	HNC-2.5S-B	For J10
J19	513400161	Connector, Receptacle	2390V-4	
CNP	513400162	Contact Pin	5167TL	For J19
J20	513201204	Connector, Receptacle	SC-1612	
CNP	513201206	Contact Pin	SC-1600-111	For J20
J22	513200404	Connector, Receptacle	CN-1625-4R-1	
CNP	513400004	Contact Pin	1855TL	For J22
P21	513400149	Connector, Plug, 32P	FCN-361P032-AG	
NUT	520110081	Nut	FCN-360A4	For P21

Figure	Part No.	Description	Type	Remarks
FPC	520110125	Flat Cable with Connector, 20P, 170mm	L170-20P-FCN	
P22	513200403	Connector, Receptacle	1625-4P-1	
CNP	513400001	Contact Pin	1854TL	For P22
J21	513400141	Connector, Receptacle, 32P	FCN-361J032-AG	
	513400142	Connector Cover	FCN-360C032-B	For J21
TB1	514400004	Terminal, Metal	SQ0204-02	
CR1	512100019	Di, LED, Orange	SLB-26VU	
CR2	512100020	Di, LED, Green	SLB-26GG	
PCB	511230070	Printed Circuit Board	2300-07	For S7
CR3~CR11	503100020	Di, Si V_R = 30V I_F = 0.1A	IS953	
J2	513400036	Connector, Receptacle	HNC2-2.5S-6	
CNP	513400037	Contact Pin	HNC-2.5S-A	x2 For J2
CNP	513400042	"	HNC-2.5S-B	x4
P3	513308803		IL8P-S3FP2	
P4	"		"	For WX2300-2
B1-X	509100023	DC Motor DC9V	28D11-219P-2	
B1-Y1	"	" "	"	
B1 Y2	"	"	"	For WX2300-2
R1-X		R, Potentiometer 20K	JCS393-0.1	
R1-Y1	506211203	R, " 15K	JCS283-0.1	
R1-Y2	"	R, " "	"	For WX2300-2
FPC-Y1	511430190	Flat Printed Cable	FPC-533-C	
FPC-Y2		"	"	For WX2300-2
FPC-Y3	043003440	"	A3YFPC	
FPC-Y4	"	"	"	For WX2300-2
SO-1	740014000	Solenoid 18Ω	GM-1	
SO-2	"	" "	"	For WX2300-2
TB2-Xa	514400010	Input Terminal Red	W-R-2	
TB2-Xb	"	" "	"	
TB2-Xc	514400011	" Black	W-B-2	
TB2-Y1a	514400010	" Red	W-R-2	
TB2-Y1b	"	" "	"	
TB2-Y1c	514400011	" Black	W-B-2	
TB2-Y2a	514400010	" Red	W-R-2	For WX2300-2
TB2-Y2b	"	" "	"	
TB2-Y2c	514400011	" Black	W-B-2	

Figure	Part No.	Description	Type	Remarks
PCB	51230010	Printed Circuit Board	2300-01A	
P1	513400078	Connector, Pin Header 12P	HNC2-2.5P-12DS	
P2	513400062	" " 6P	HNC2-2.5P-6DS	
P5	513400070	" " 4P	HNC2-2.5P-4DS	
P6	513400062	" " 6P	HNC2-2.5P-6DS	
P7	513400102	" " 5P	HNC2-2.5P-5DS	
P8	513400085	" " 15P	HNC2-2.5P-15DS	
P9	513400140	" " 20P	FCN-744P020-AU/R	
P10	513400078	" " 12P	HNC2-2.5P-12DS	
P15	513400160	" " 26P	FCN-704P026-AU/M	
J11	513300604	Connector, Card Edge 10Px2	225J21021-487	
J12	513300604	" " 10Px2	225J21021-487	
J13-X	513300603	" " 15Px2	225J21521-487	
J13-Y1	513300603	" " 15Px2	225J21521-487	
J13-Y2	513300603	" " 15Px2	225J21521-487	For WX2300-2
J14	513300603	" " 15Px2	225J21521-487	
J3	513308804	Connector, Receptacle 8P	CN, ILD8S-3TA2	
J4	513308804	" " 8P	CN, ILD8S-3TA2	For WX2300-2
K1	515100031	Relay DC 12V 250Ω	HB2-DC12V	
K2	"	" " "	"	
K3	"	" " "	"	
K4	"	" " "	"	
CR1	503100021	Di, Si V_R = 200V I_F = 1.1A	V06C	
CR2	"	Di, Si " "	"	
R3	501810313	R, Metal Film 1.3kΩ 1/4W ±1%	RN1/4-1.3KF	
R1-X	501605732	R, " 0.22Ω 1W ±5%	RSF1B-0.22J	
R1-Y1	501605733	R, " 0.47Ω " "	RSF1B-0.47J	
R1-Y2	"	R, " " " "	"	For WX2300-02
R2-X	501442324	R, " 5.6kΩ 1/4W ±0.25%	RP82C5.6KC	
R2-Y1	"	R, " " " "	"	
R4-X	501609725	R, Wire-wound 5Ω 10W ±5%	MU10P-5J	
R4-Y1	501609726	R, " " " "	MU10P-10J	
R4-Y2	"	R, " 10Ω " "	"	For WX2300-02
R5-X	501810327	R, Metal Film 2.7kΩ 1/4W ±1%	RN1/4-2.7KF	
R5-Y1	"	R, " " " "	"	
R5-Y2	"	R, " " " "	"	For WX2300-02
R6-X	501810368	R, " 6.8kΩ 1/4W "	RN1/4-6.8KF	
R6-Y1	"	R, " " " "	"	
R6-Y2	"	R, " " " "	"	For WX2300-02
R7-X	"	R, " " " "	"	

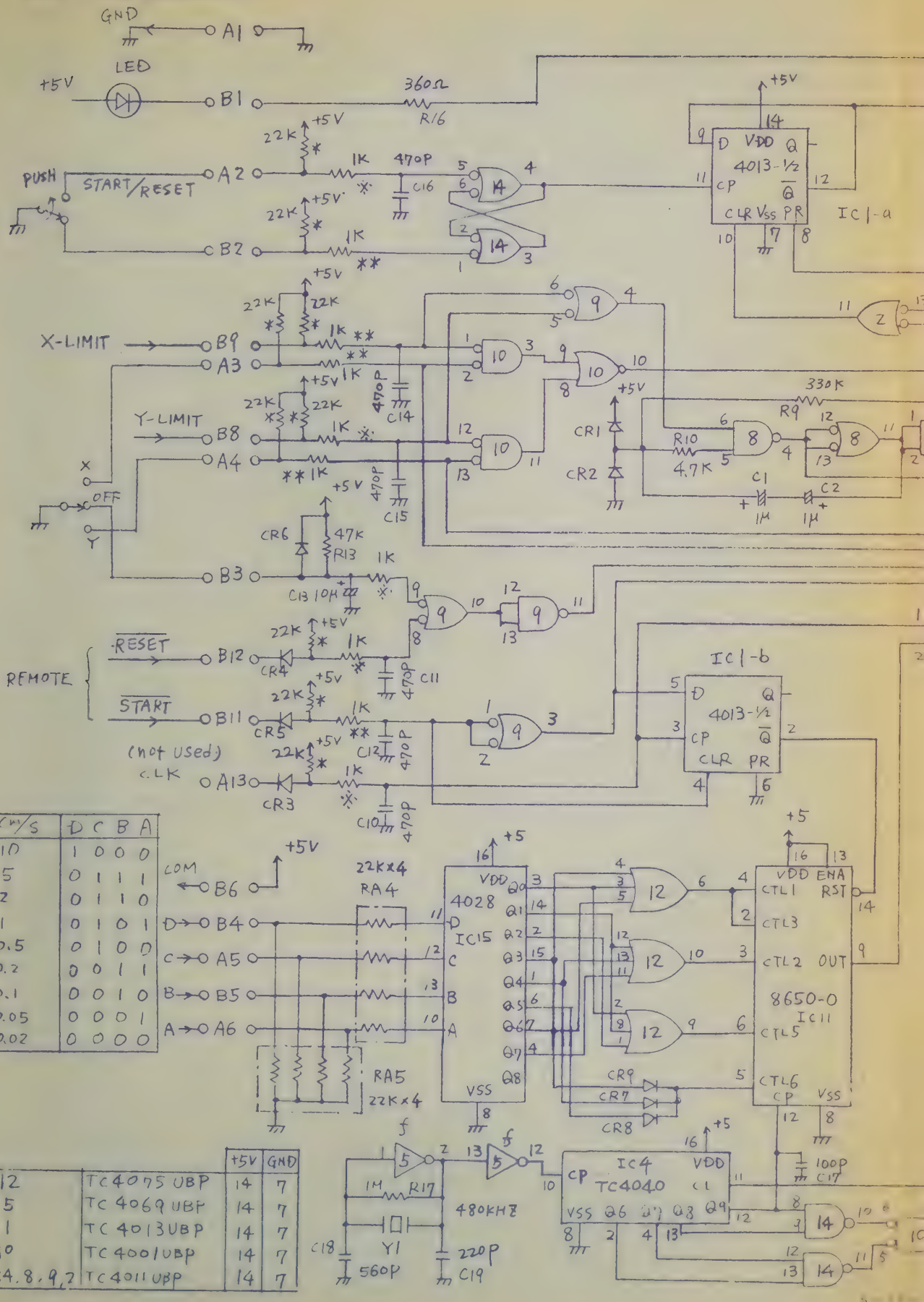
Figure	Part No.	Description	Type	Remarks
R7-Y1	501810368	R, Metal Film 6.8k 1/4W 1%	RN1/4-6.8KF	
R7-Y2	"	R, " " " "	"	For WX2300-02
TB1	513400027	Test Terminal	LC-1-10	
TB2	"	"	"	
TB3	"	"	"	For WX2300-2
TB4	"	"		

Sub Board

Figure	Part No.	Description	Type	Remarks
PCB	511430040	Printed Circuit Board	4301-090	For WX2300-1
PCB	511430090	"	4301-021	For WX2300-2
C1	502601004	C, Oil 0.01μ 630WV	OP63T-01	
C2	"	C, " " "	"	
C3	"	C, " " "	"	For WX2300-2
FC	520110056	Flat Cable with Connector (26P)	L100-26	
J18-X	513300604	Flat Cable, Card Edge 10Px2	225J21021-487	
J18-Y1	"	" " "	"	
J18-Y2	513300604	Connector, Card Edge 10Px2	225J21021-487	For WX2300-2

Power Board

Figure	Part No.	Description	Type	Remarks
PCB	511230080	Printed Circuit Board	2300-08	
P19	513400163	Connector, Pin Header 4P	5289-4A	
J8	513400084	Connector, Receptacle 15P	HNC2-2.5S15	
CNP	513400037	Contact Pin	HNC2-2.5S-A	For J8
DC/DC	518100003	DC/DC Converter	ETW-R35DT1A2	
CR1	503100051	Di, Bridge V_R = 600V I_F = 6A	KBPC8-06	
CR3	503100021	Di, Si V_R = 30V I_F = 1.1A	V06C	
CR4	"	Di, Si " "	"	
C1	502103064	C, Electrolytic 1500μ 25V	ECES1EV153X	
C2	"	C, " " "	"	
C3	502103018	C, " 100μ "	SL25VB-100	
R1	501810410	R, Metal Film 10K 1/4W ±1%	RN1/4-10KF	
R2	"	R, " " " "	"	
R3	"	R, " " " "	"	
R4	501810615	R, " 1.5M " "	RN1/4-1.5MF	



CW/S	D	C	B	A
10	1	0	0	0
5	0	1	1	1
2	0	1	1	0
1	0	1	0	1
0.5	0	1	0	0
0.2	0	0	1	1
0.1	0	0	1	0
0.05	0	0	0	1
0.02	0	0	0	0

		+5V	GND
12	TC4075 UBP	14	7
5	TC4069 UBP	14	7
1	TC4013 UBP	14	7
10	TC4001 UBP	14	7
14, 8, 9, 2	TC4011 UBP	14	7

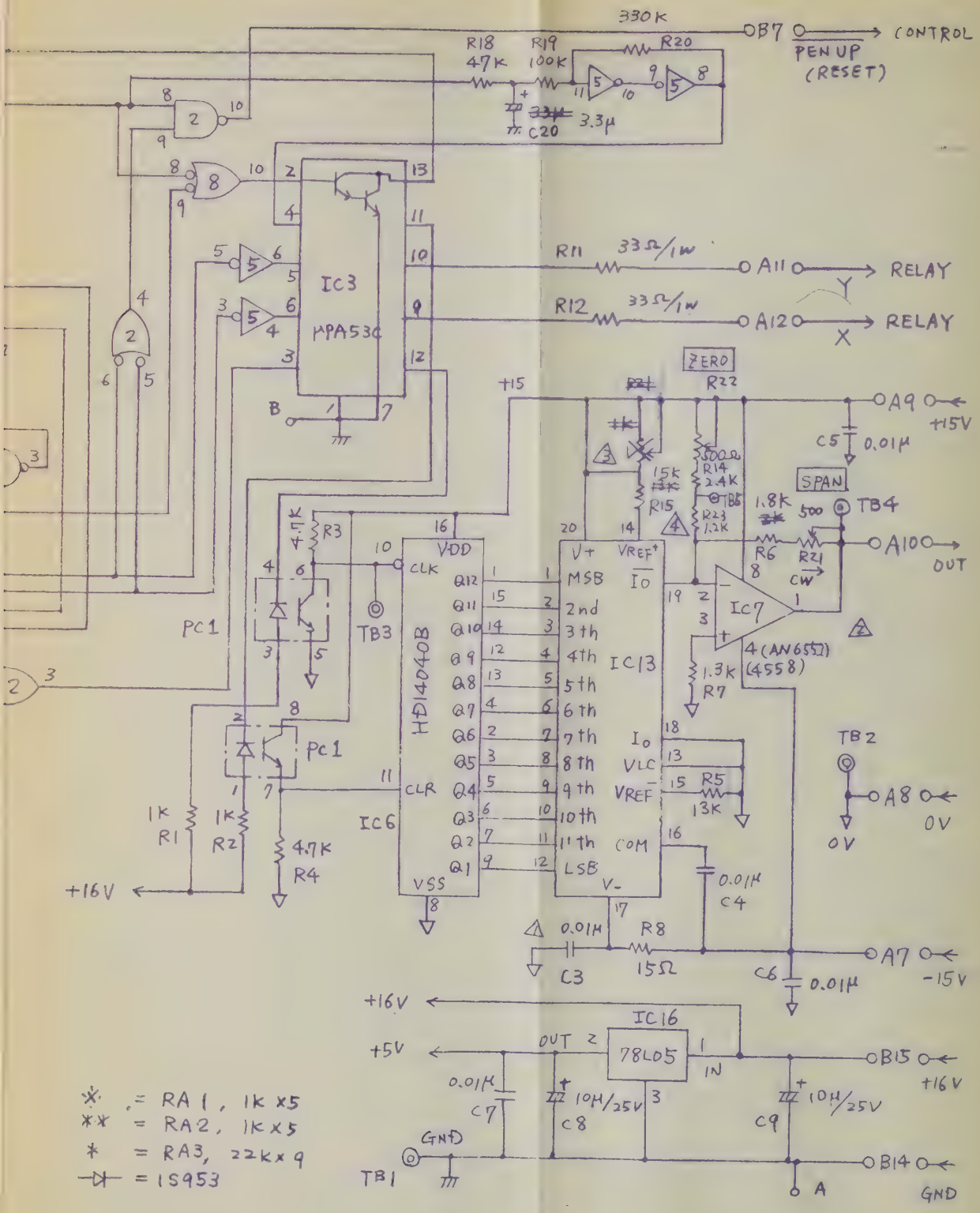
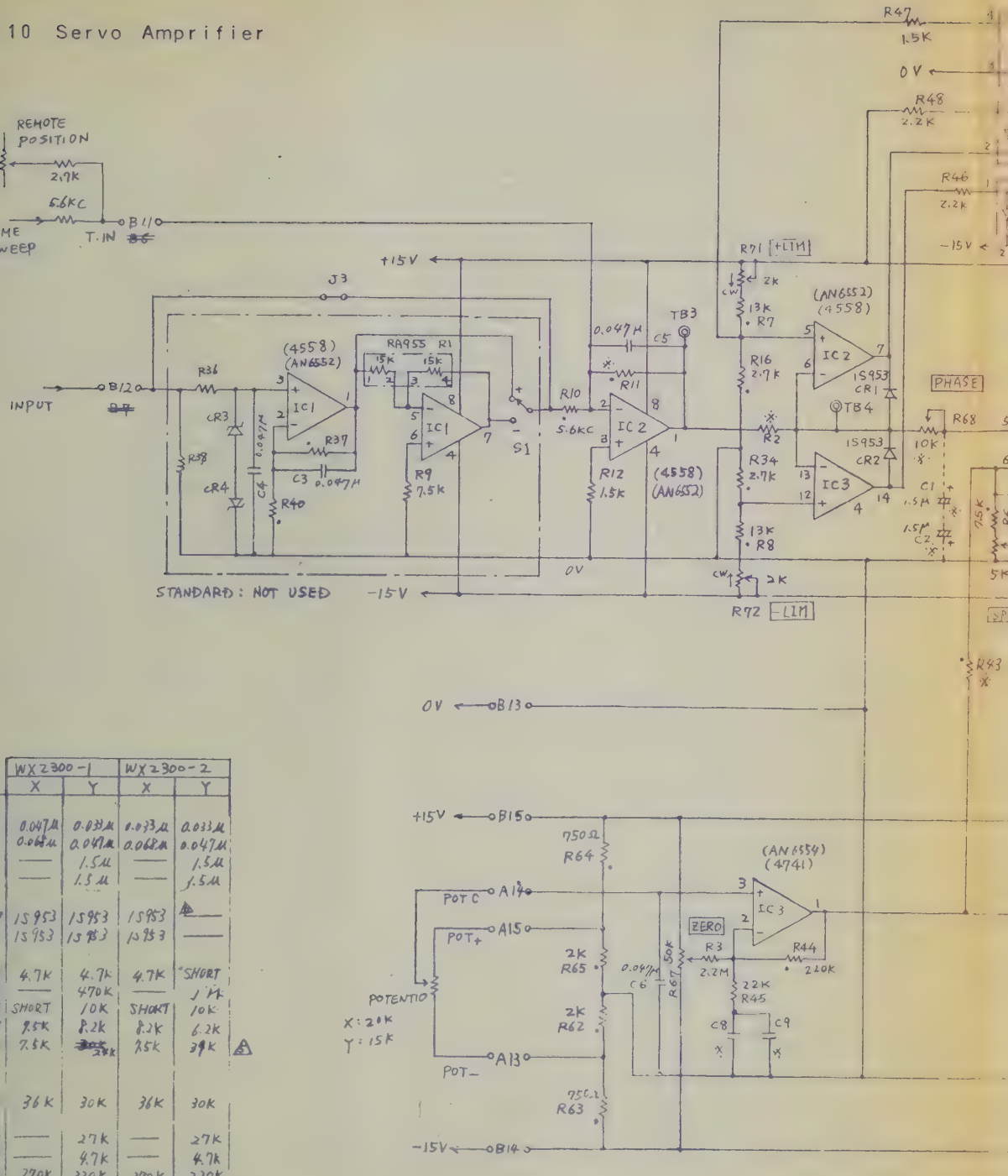

330K
OB7
CONTROL
PEN UP
(RESET)
R18
47K
R19
100K
R20
C20
3.3μ
IC3
MPA53C
R11
33Ω/1W
A11
RELAY
R12
33Ω/1W
A12
RELAY
ZERO
R21
R22
+15
A9
+15V
C5
0.01μ
SPAN
TB4
1.8K
500
R6
R21
A10
OUT
R3
TB3
PC1
IC13
HD14040B
MSB
2nd
3th
4th
5th
6th
7th
8th
9th
10th
11th
LSB
IC7
4(AN6552)
(4558)
1.3K
R7
TB2
A8
0V
R5
13K
1K
R1
1K
R2
4.7K
R4
IC6
+16V
0.01μ
C4
C3
R8
15Ω
A7
-15V
C6
0.01μ
IC16
78L05
+5V
B15
+16V
C7
C8
10μ/25V
C9
10μ/25V
GND
TB1
B14
GND
A
* = RA1, 1K x5
** = RA2, 1K x5
* = RA3, 22K x 9
= 1S953

Figure	Part No.	Description	Type	Remarks
PCB	511230020	Printed Circuit Board	2300-02A	
IC2	503300064	IC, CMOS Dual D-Flip Flop	TC4013BP	
IC2	503300062	IC, " Quad 2-Input NAND	TC4011BP	
IC3	503300053	IC	UPA53C	
IC4	503303348	IC, CMOS 12-Stage Binary Counter	TC4040UBP	
IC5	503303364	IC, " Hex Inverter	TC4069UBP	
IC6	503301037	IC, "	HD14040B	
IC7	503301057	IC, Dual Operational Amplifiers	AN6552	
IC8	503300062	IC, CMOS Quad 2-Input NAND	RC4011BP	
IC9	"	IC, " "	"	
IC10	503300124	IC, " " NOR	TC4001BP	
IC11	503300100	IC, Programable Counter	8650-0	
IC12	503303368	IC, CMOS Triple 3-Input OR	TC4075BP	
IC13		IC, D/A Converter	UPC648C	
IC14	503300062	IC CMOS Quad 2-Input NAND	TC4011BP	
IC15	503303339	IC, " BCD to Decimal Divider	TC4028BP	
IC16	503301064	IC, Voltage Regulator 5V	UPC78L05	
PC1	503300144	Photo Coupler	TLP521-2	
CR1	503100020	Di, Si V_R = 30V I_F = 100mA	IS953	
CR2	"	Di, " " "	"	
CR3	"	Di, " " "	"	
CR4	"	Di, " " "	"	
CR5	"	Di, " " "	"	
CR6	"	Di, " " "	"	
CR7	"	Di, " " "	"	
CR8	"	Di, " " "	"	
CR9	"	Di, " " "	"	
C1	502203013	C, Tantalum 1μ 35WV	CS15E1V010M	
C2	"	C, " " "	"	
C3	502403007	C, Ceramic 0.01μ 50WV	ULD06-103-L2A	
C4	"	C, " " "	"	
C5	"	C, " " "	"	
C6	"	C, " " "	"	
C7	"	C, " " "	"	
C8	502103023	C, Electrolytic 10μ 25WV	SM25VB-10	
C9	"	C, " " "	"	
C10	502403003	C, Ceramic 470P 50WV	USD04-SL-471K	
C11	"	C, " " "	"	
C12	"	C, " " "	"	
C13	502103023	C, Electrolytic 10μ 25WV	SM25VB-10	
C14	502403003	C, Ceramic 470P 50WV	USD04-SL-471K	

Figure	Part No.	Description				Type	Remarks
C15	502403003	C, Ceramic	470P	50WV		USD04-SL-471K	
C16	"	C, "	"	"		"	
C17	502403009	C, "100	P	"		UFD04-101K-K2J	
C18	502403086	C, Ceramic	560P	"		USD04-SL-561K	
C19	502403035	C,				UFD04SA-221J-L0B	
C20	502203003	C, Tantalum	3.3μ	16WV		CS15E1C3R3M	
Y1	502802014	Oscillator 480kHz				CRK-480KHZ	
RA1	501003347	Resistor Array				RMX-A5-102-K	
RA2	"	"				"	
RA3	501002815	"				RMX-S9-223-J	
RA4	501003306	"				RMX-A4-223-K	
RA5	501002814	"				RMX-S4-223-J	
R1	501810310	R, Metal Film	1K	1/4W	±1%	RN1/4-1K	
R2	"	R, "	"	"	"	"	
R3	501810347	R, "	4.7K	"	"	RN1/4-4.7K	
R4	"	R, "	"	"	"	"	
R5	501810413	R, "	13K	"	"	RN1/4-13K	
R6	501810318	R, "	1.8K	"	"	RN1/4-1.8K	
R7	501810313	R, "	1.3K	"	"	RN1/4-1.3K	
R8	501810115	R, "	15Ω	"	"	RN1/4-15	
R9	501810533	R, "	330K	"	"	RN1/4-330K	
R10	501810347	R, "	4.7K	"	"	RN1/4-4.7K	
R11	501605712	R, Wire-wound	33Ω	1W	5%	MU1P-33J	
R12	"	R, "	"	"	"	"	
R13	501810447	R, Metal Film	47K	1/4W	1%	RN1/4-47K	
R14	501810324	R, "	2.4K	"	"	RN1/4-2.4K	
R15	501810415	R, "	15K	"	"	RN1/4-15K	
R16	501810236	R, "	360Ω	"	"	RN1/4-360	
R17	501810610	R, "	1M	"	"	RN1/4-1M	
R18	501810447	R, "	47K	"	"	RN1/4-47K	
R19	501810510	R, "	100K	"	"	RN1/4-100K	
R20	501810533	R, "	330K	"	"	RN1/4-330K	
R21	505103001	R, Trimmer	500Ω			GF06X-500	
R22	"	R, "	"			"	
R23	501810312	R, Metal Film	1.2K	1/4W	±1%	RN1/4-1.2K	
TB1	513400027	Test Terminal				LC-1-10	
TB2	"	"				"	
TB3	"	"				"	
TB4	"	"				"	

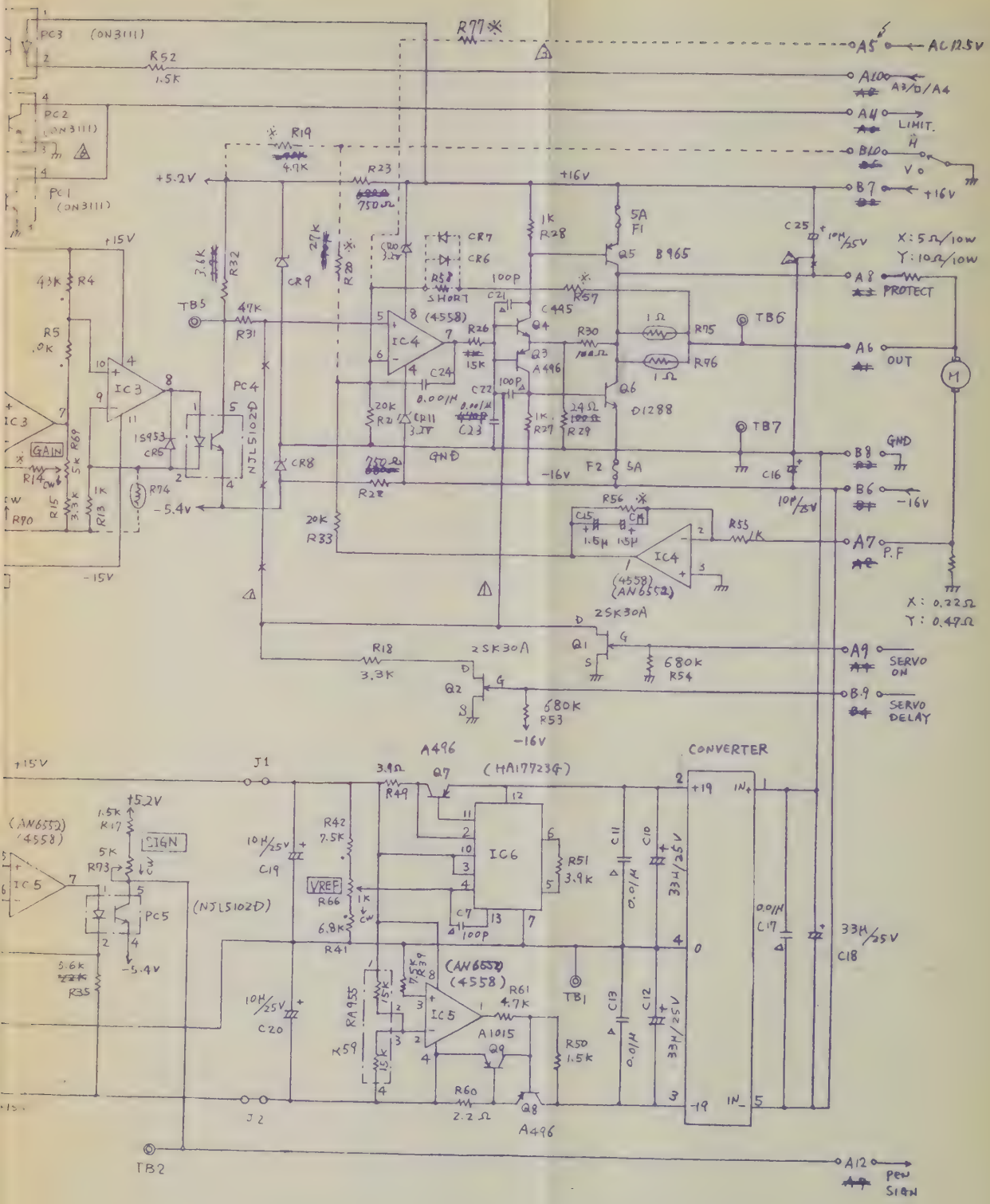
5-10 Servo Amprifier



	WX2300-1		WX2300-2	
	X	Y	X	Y
C9	0.047μ	0.033μ	0.033μ	0.033μ
C8	0.047μ	0.047μ	0.068μ	0.047μ
C2	——	1.5μ	——	1.5μ
C1	——	1.5μ	——	1.5μ
CR7	1S953	1S953	1S953	——
CR6	1S953	1S953	1S953	——
R58	4.7K	4.7K	4.7K	SHORT
R71	——	470K	——	1 M
R68	SHORT	10K	SHORT	10K
R57	7.5K	8.2k	8.2k	6.2k
R56	7.5K	~~30k~~ 7.5k	7.5k	39k
R43	36K	30K	36K	30K
R20	——	27K	——	27K
R19	——	4.7K	——	4.7K
R14	270K	220K	270K	220K
R11	2.6kC	5.1kC	2.6kC	5.1kC
R2	7.5K	7.5K	7.5K	9.1K

	A		B
	1		
	2		
	3		
	4		
AC 25V	5		
OUTPUT	6	-16V	
P.F.B	7	+16V	
PROTECT	8	GND	
SERVO-ON	9	S-DELAY	
A3/0/A4	10	V/H	
LIMIT	11	EXT. IN	
PEN-SIGN	12	INPUT	
POT-	13	0V	
POT C	14	-15V	
POT+	15	+15V	

4) CR6, CR7. not used
3) JUMPER: J1, J2, J3
2) C(4): CERAMIC
1) R(•): Tc = 50PPM/°C


PC3 (ON3111)
PC2 (ON3111)
PC1 (ON3111)
R52 1.5K
R77 ※
A5 AC12.5V
A10 A3/D/A4
A4 LIMIT. H
B10 V o
B7 +16V
R19 4.9K
+5.2V
R23 750Ω
+16V
5A F1
Q5 B965
C25 10M/35V
X: 5Ω/10W
Y: 10Ω/10W
A8 PROTECT
+15V
43K R4
5.0K R5
3.6K R32
CR9
27K R8
CR7
CR6
R58 SHORT
100P
C21
R57
TB5
47K R31
IC4 (4558)
C445
Q4
R26 15K
R30
Q3 A496
1Ω R95
1Ω R96
TB6
A6 OUT
M
C24 0.001M
C22 100P
C23 0.001M
20K R21
CR11 3.3V
1K R27
24Ω R29
Q6 D1288
TB7
GND
B8 GND
IC3
GAIN
R69 5K
R14 CW
R15 3.3K
R13 1K
R70
R74
-5.4V
PC4 (NJL5102D)
1S953 CR5
CR8
750Ω R22
F2 5A
-16V
C16 10M/25V
B6 -16V
20K R33
R56 ※
C15 1.5M
CM 15M
IC4 (4558) (AN6552)
R55 1K
A7 P.F
X: 0.22Ω
Y: 0.47Ω
-15V
2SK30A
Q1
R18 3.3K
2SK30A
Q2
680K R54
680K R53
A9 SERVO ON
B9 SERVO DELAY
A496
Q7 (HA17723G)
CONVERTER
+15V
J1
3.9Ω R49
+19 IN+
+5.2V
1.5K R17
SIGN
5K R73
(AN6552) (4558)
IC5
PC5 (NJL5102D)
R42 2.5K
10M/25V C19
VREF
R66 1K CW
6.8K R41
IC6
R51 3.9K
C7 100P
C11 0.01M
C10 33M/25V
0.01M C17
33M/25V C18
5.6K R35
-5.4V
10M/25V C20
R59 5K
R58 1K
R55 1K
(AN6552) (4558)
IC5
R61 4.7K
A1015 Q9
TB1
C13 0.01M
C12 33M/25V
R50 1.5K
R60 2.2Ω
Q8 A496
-19 IN-
J2
TB2
A12 PEN SIGN

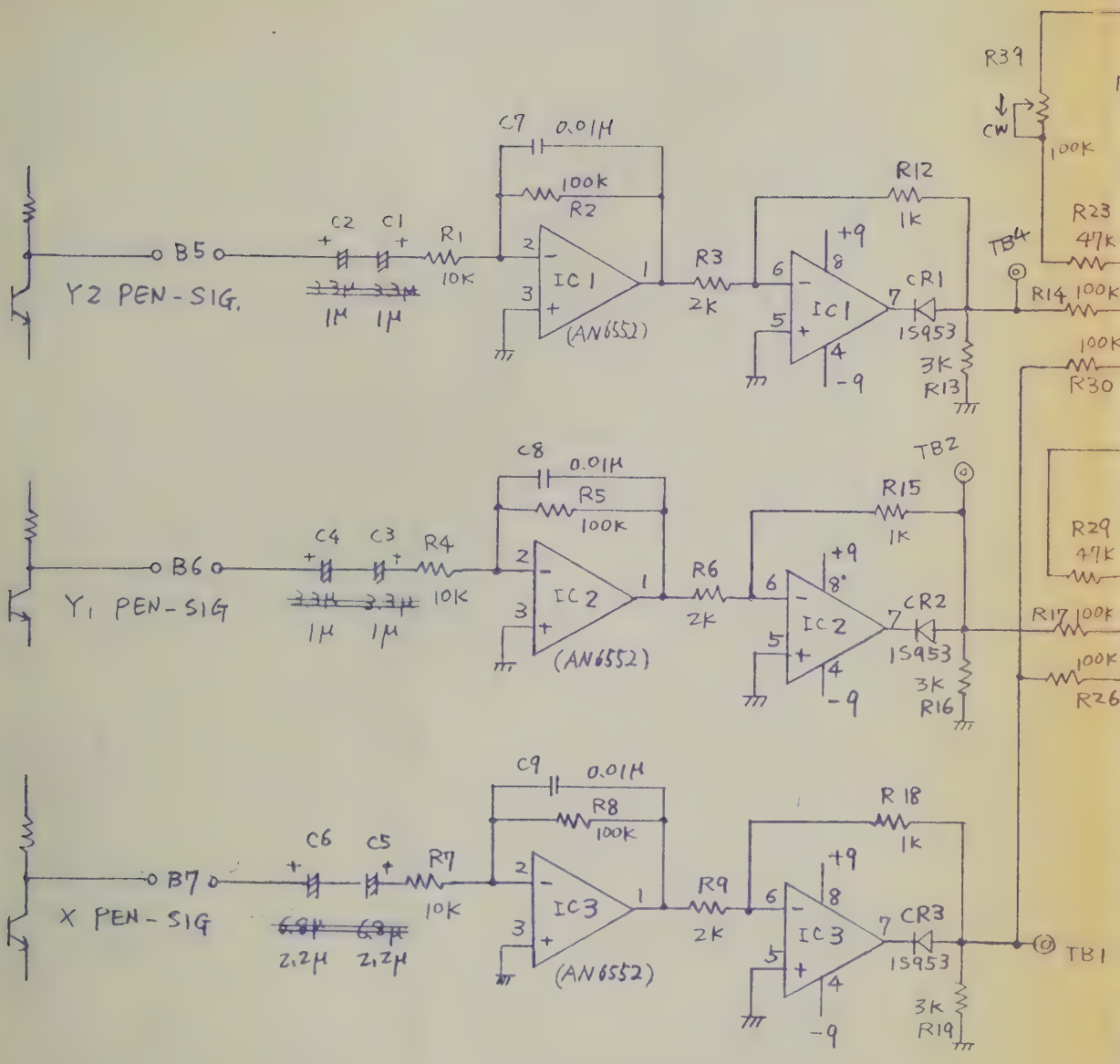
Servo Amplifier

Figure	Part No.	Description				Type	Remarks
PCB	511230030	Printed Circuit Board				2300-03A	
IC2	503301057	IC, Dual Operational Amplifiers				AN6552	
IC3	503301058	IC, Quadruple Operational Amplifiers				AN6554	
IC4	503301057	IC, Dual Operational Amplifiers				AN6552	
IC5	"	IC, "				"	
IC6	503300117	IC, Regulator				HA17723G	
PC1	503301060	Photo Coupler				ON3111, R	
PC2	"	"				"	
PC3	"	"				"	
PC4	503300055	"				NJL5102D	
PC5	"	"				"	
DC/DC	518100009	DC/DC Converter				GE-0322B	
Q1	503200027	T, N-J-FET				25K30A-Y	
Q2	"	T, "				"	
Q3	503200003	T, PNP	−50V	−1A	1W	2SA-496-Y	
Q4	503200011	T, NPN	50V	1A	1W	2SC495	
Q5	503203053	T, PNP	−120V	−7A	70W	2SB965-Q	
Q6	503203054	T, NPN	120V	7A	70W	2SD1288-Q	
Q7	503200003	T, PNP	−50V	−1A	1W	2SA-496-Y	
Q8	"	T, "	"	"	"	"	
Q9	503203016	T, "	−30V	−100mA	200mW	2SA1015-Y	
CR1	503100020	Di, Si	V_R = 30V		I_F = 100mA	IS953	
CR2	"	Di, "	"		"	"	
CR5	"	Di, "	"		"	"	
CR6	"	Di, "	"		"	"	
CR7	"	Di, "	"		"	"	
CR8	503100003	Di, Zenner	5.4V		500mW	RD5.6EB1	
CR9	503100060	Di, "	5.2V		"	RD5.1EB3	
CR10	503100052	Di, "	3.2V		"	RD3.3EB2	
CR11	"	Di, "	"		"	"	
F1	512300032	Fuse, 5A				MC-5	
F2	"	" "				"	
C1	502203024	C, Tantalum	1.5μ	20WV		CS15E1D1R5M	Y Axis
C2	"	C, "	"	"		"	"
C5	502303005	C, Myler Film	0.047μ	50WV		MFL-05S47	
C6	"	C, "	"	"		"	
C7	502403009	C, Ceramic	0.01μ	"		UF04-101K-K2J	
C8	502303014	C, Myler Film	0.068μ	"		MFL-05S68	X Axis

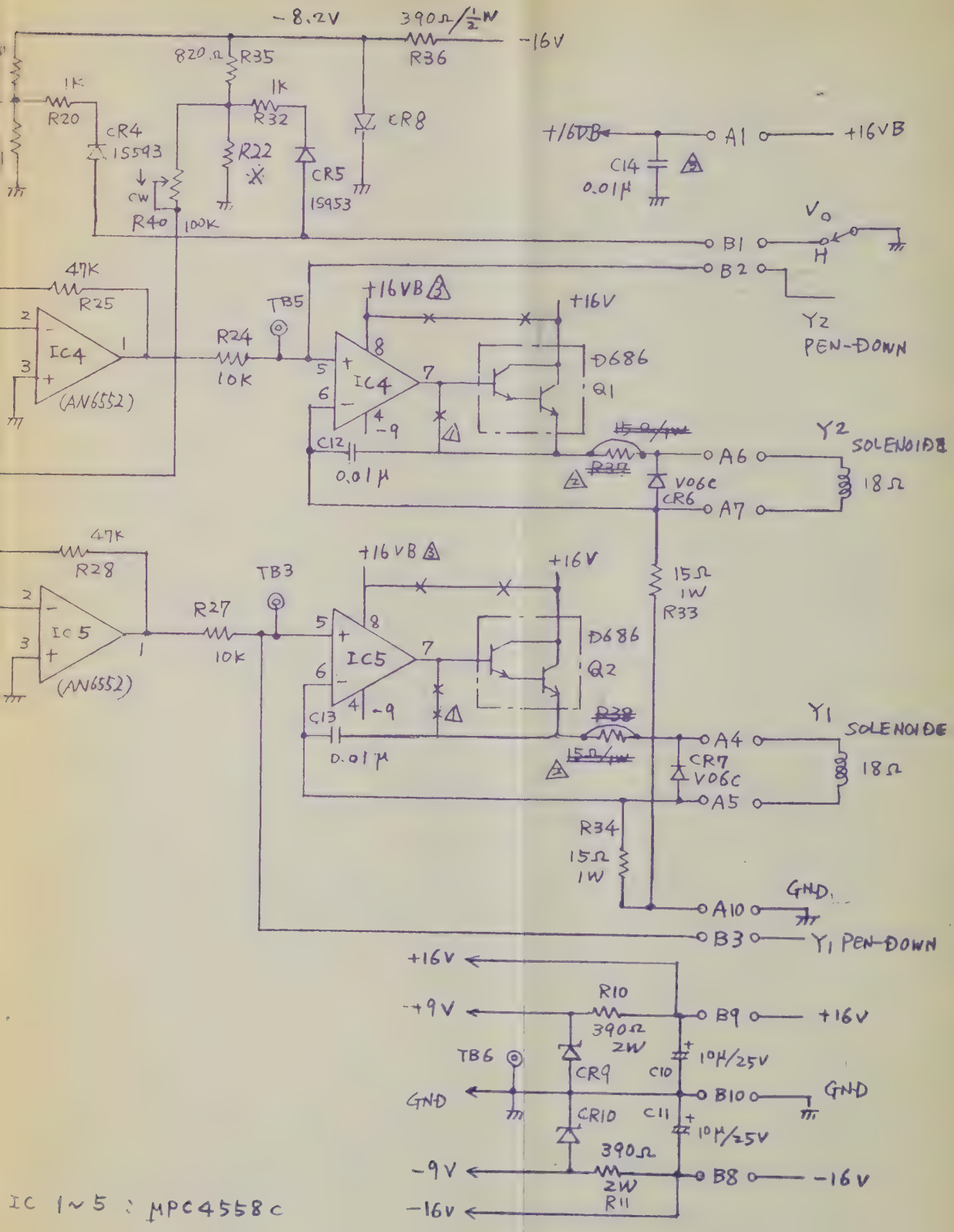
Figure	Part No.	Description			Type	Remarks
C8	502303005	C, Myler Film	0.047μ	50WV	MFL-05S47	Y Axis
C9	"	C, "	"	"	"	WX2300-1 X
C9	502303009	C, "	0.033μ	"	MFL-05S33	WX2300-2 X
C9	"	C, "	"	"	"	Y Axis
C10	502101028	C, Electrolytic	33μ	25WV	SM25VB-33	
C11	502003007	C, Ceramic	0.01μ	50WV	ULD06-103-L2A	
C12	502101028	C, Electrolytic	33μ	25WV	SM25VB-33	
C13	502403007	C, Ceramic	0.01μ	50WV	ULD06-103-L2A	
C14	502203024	C, Tantalum	1.5μ	20WV	CS15E1D1R5M	
C15	"	C, "	"	"	"	
C16	502103023	C, Electrolytic	10μ	25WV	SM25VB-10	
C17	502403007	C, Ceramic	0.01μ	50WV	ULD06-103-L2A	
C18	502101028	C, Electrolytic	33μ	25WV	SM25VB-33	
C19	502103023	C, "	10μ	"	SM25VB-10	
C20	"	C, "	"	"	"	
C21	502403009	C, Ceramic	0.01μ	50WV	UF04-101K-K2J	
C22	"	C, "	"	"	"	
C23	502303002	C, Myler Film	0.001μ	"	MFL-05D1	
C24	"	C, "	"	"	"	
C25	502103023	C, Electrolytic	10μ	25WV	SM25VB-10	
R2	501810375	R, Metal Film	7.5K	1/4W ±1%	RN1/4-7.5KF	X Axis
R2	"	R, "	"	" "	"	WX2300-1Y
R2	501810391	R, "	9.1K	" "	RN1/4-9.1KF	WX2300-2Y
R3	501810622	R, "	2.2M	" "	RN1/4-2.2MF	
R4	501443609	R, "	43K	" "	RP44C43KF	
R5	501443619	R, "	10K	" "	RP44C10KF	
R6	501443603	R, "	7.5K	" "	RP44C7.5KF	
R7	501443604	R, "	13K	" "	RP44C13KF	
R8	"	R, "	"	" "	"	
R10	501442324	R, "	5.6K	1/8W ±0.25%	RP82C5.6KC	
R11		R, "	3.6K	" "	RP82C3.6KC	X Axis
R11	501442327	R, "	5.1K	" "	RP82C5.1KC	Y Axis
R12	501810315	R, "	1.5K	1/4W ±1%	RN1/4-1.5KF	
R13	501810310	R, "	1K	" "	RN1/4-1KF	
R14	501810527	R, "	270K	" "	RN1/4-270KF	X Axis
R14	501810522	R, "	220K	" "	RN1/4-220KF	Y Axis
R15	501810333	R, "	3.3K	" "	RN1/4-3.3KF	
R16	501443605	R, "	2.7K	" "	RP44C2.7KF	
R17	501810315	R, "	1.5K	" "	RN1/4-1.5KF	
R18	501810333	R, "	3.3K	" "	RN1/4-3.3KF	
R19	501810347	R, "	4.7K	" "	RN1/4-4.7KF	Y Axis
R20	501810427	R, "	27K	" "	RN1/4-27KF	Y Axis
R21	501810420	R, "	20K	" "	RN1/4-20KF	
R22	501810275	R, "	750Ω	" "	RN1/4-750F	

Figure	Part No.	Description			Type	Remarks
R23	501810275	R, Metal Film	750Ω	1/4W ±1%	RN1/4-750F	
R26	501810415	R, "	15K	" "	RN1/4-15KF	
R27	501810310	R, "	1K	" "	RN1/4-1KF	
R28	"	R, "	"	" "	"	
R29	501810124	R, "	24Ω	" "	RN1/4-24F	
R30	501810210	R, "	100Ω	" "	RN1/4-100F	
R31	501810447	R, "	47K	" "	RN1/4-47KF	
R32	501810336	R, "	3.6K	" "	RN1/4-3.6KF	
R33	501810420	R, "	20K	" "	RN1/4-20KF	
R34	501443605	R, "	2.7K	" "	RP44C2.7KF	
R35	501810356	R, "	5.6K	" "	RN1/4-5.6KF	
R39	501810375	R, "	7.5K	" "	RN1/4-7.5KF	
R41	501443607	R, "	6.8K	" "	RP44C6.8KF	
R42	501443603	R, "	7.5K	" "	RP44C7.5KF	
R43	501810430	R, "	30K	" "	RN1/4-30KF	Y Axis
R43		R, "	36K	" "	RP44C36KF	X Axis
R44		R, "	220K	" ±5%	RP42C220KJ	
R45	501810422	R, "	22K	" ±1%	RN1/4-22KF	
R46	501810322	R, "	2.2K	" "	RN1/4-2.2KF	
R47	501810315	R, "	1.5K	" "	RN1/4-1.5KF	
R48	501810322	R, "	2.2K	" "	RN1/4-2.2KF	
R49	501203783	R, "	3.9Ω	" ±5%	RC1/4-3.9J	
R50	501810315	R, "	1.5K	" ±1%	RN1/4-1.5KF	
R51	501810339	R, "	3.9K	" "	RN1/4-3.9KF	
R52	501810315	R, "	1.5K	" "	RN1/4-1.5KF	
R53	501810568	R, "	680K	" "	RN1/4-680KF	
R54	"	R, "	"	" "	"	
R55	501810310	R, "	1K	" "	RN1/4-1KF	
R56	501810375	R, "	7.5K	" "	RN1/4-7.5KF	X Axis
R56	501810424	R, "	24K	" "	RN1/4-24KF	WX2300-1Y
R56	501810439	R, "	39K	" "	RN1/4-39KF	WX2300-2Y
R57	501810375	R, "	7.5K	" "	RN1/4-7.5KF	WX2300-1X
R57	501810382	R, "	8.2K	" "	RN1/4-8.2KF	WX2300-2X,-1Y
R57	501810362	R, "	6.2K	" "	RN1/4-6.2KF	WX2300-2Y
R58	501810347	R, "	4.7K	" "	RN1/4-4.7KF	
R59	501003313	R, Array	1.5Kx2	±0.1%	RA955	
R60	501203701	R, Metal Film	2.2Ω	1/4W ±5%	RC1/4-2.2J	
R61	501810347	R, "	4.7K	" ±1%	RN1/4-4.7KF	
R62	501443631	R, "	2K	" "	RP44C2KF	
R63	501443626	R, "	750Ω	" "	RP44C750F	
R64	"	R, "	"	" "	"	
R65	501443631	R, "	2K	" "	RP44C2KF	
R66	505103011	R, Trimmer	1K		GF06X-1K	
R67	505103024	R, "	50K		GF06X-50K	
R68	505103016	R, "	10K		GF06X-10K	Y Axis

Figure	Part No.	Description			Type	Remarks
R69	505103019	R, Trimmer	5K		GF06X-5K	
R70	〃	R, 〃	〃		〃	
R71	505103009	R, 〃	2K		GF06X-2K	
R72	〃	R, 〃	〃		〃	
R73	505103019	R, 〃	5K		GF06X-5K	
R75	502901001	R, Posister	.1Ω		012PD-83B9-1R0M	
R76	〃	R, 〃	〃		〃	
R77	501810547	R, Metal Film	470K	1/4W ±1%	RN1/4-470KF	WX2300-1Y
R77	501810610	R, 〃	1M	〃 〃	RN1/4-1MF	WX2300-2Y
TB1	513400027	Test Terminal			LC-1-10	
TB2	〃	〃			〃	
TB3	〃	〃			〃	
TB4	〃	〃			〃	
TB5	〃	〃			〃	
TB6	〃	〃			〃	
TB7	〃	〃			〃	



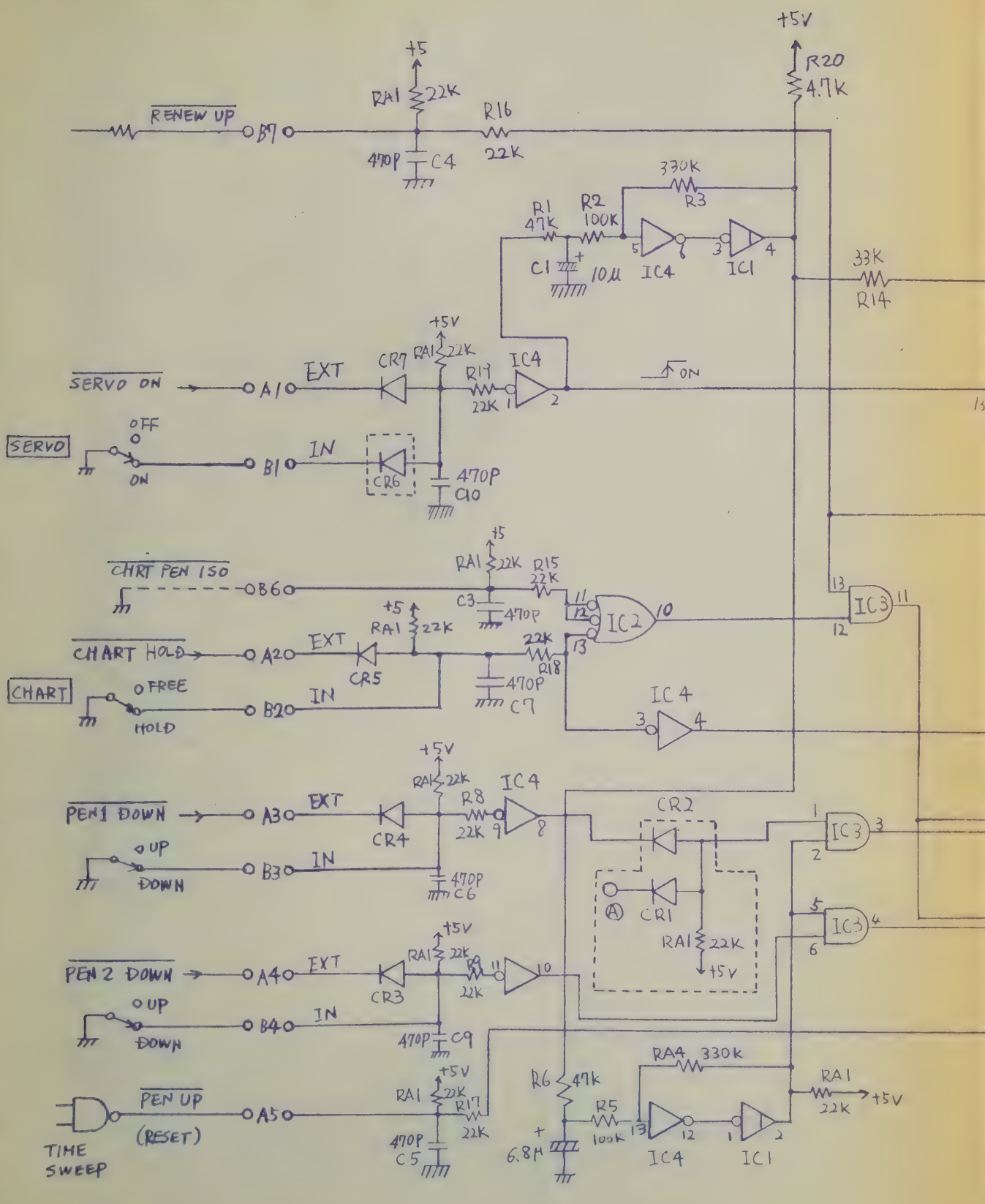
	2300-1	2300-2
R21	——	2.2K
R22	1.2K	2.2K

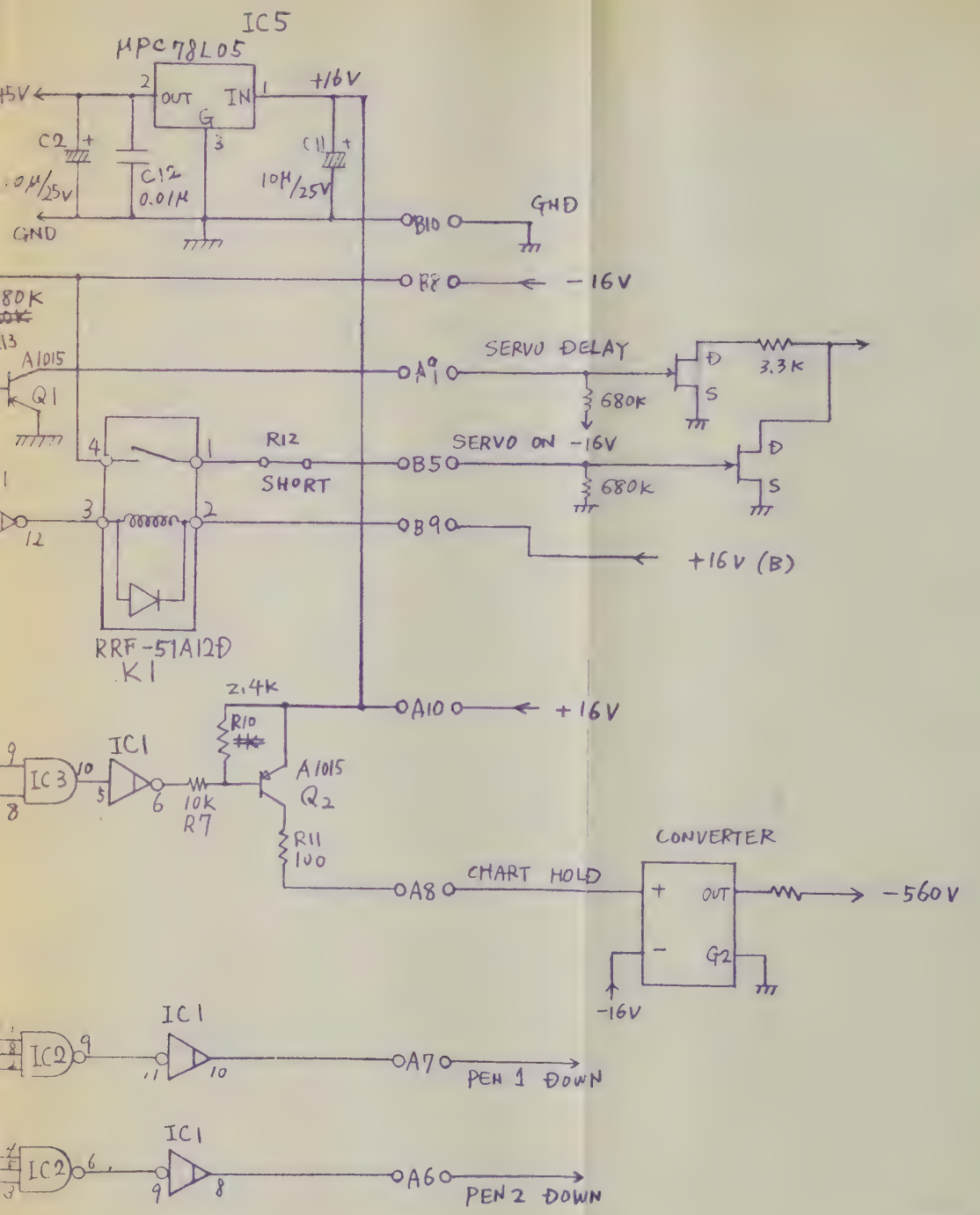


IC 1~5 : μPC4558C

Figure	Part No.	Description	Type	Remarks
PCB	511230040	Printed Circuit Board	2300-04A	
IC1	503301057	IC, Dual Operational Amplifiers	AN6552	For WX2300-2
IC2	"	IC, "	"	
IC3	"	IC, "	"	
IC4	"	IC, "	"	For WX2300-2
IC5	"	IC, "	"	
Q1	503200024	T, NPN Darlington 4A	2SD686	
Q2	"	T, " " "	"	
CR1	503100020	Di, Si V_R = 30V I_F = 100mA	IS953	For WX2300-2
CR2	"	Di, " " "	"	
CR3	"	Di, " " "	"	
CR4	"	Di, " " "	"	For WX2300-2
CR5	"	Di, " " "	"	
CR6	503100021	Di, " V_R = 200V I_F = 1.1A	SD, V06C	For WX2300-2
CR7	"	Di, " " "	"	
CR8	503100007	Di, Zenner 8.2V 1/2W	RD8.2EB3	
CR9	503100011	Di, " 9.1V "	RD9.1FB3	
CR10	"	Di, " " "	"	
C1	502203028	C, Tantalum 1μ 25WV	CS15E1E010M	For WX2300-2
C2	"	C, " " "	"	"
C3	"	C, " " "	"	
C4	"	C, " " "	"	
C5	502203005	C, " 2.2μ "	CS15E1C2R2M	
C6	"	C, " " "	"	
C7	502403007	C, Ceramic 0.01μ 50WV	ULD06-103-L2A	For WX2300-2
C8	"	C, " " "	"	
C9	"	C, " " "	"	
C10	502103023	C, Electrolytic 10μ 25WV	SM25VB-10	
C11	"	C, " " "	"	
C12	502403007	C, Ceramic 0.01μ 50WV	ULD06-103-L2A	For WX2300-2
C13	"	C, " " "	"	
C14	"	C, " " "	"	
TB1	513400027	Test Terminal	LC-1-10	
TB2	"	"	"	
TB3	"	"	"	
TB4	"	"	"	For WX2300-2
TB5	"	"	"	"
TB6	"	"	"	

Figure	Part No.	Description				Type	Remarks
R1	501810410	R, Metal Film	10K	1/4W	±1%	RN1/4-10K	
R2	501810510	R, "	100K	"	"	RN1/4-100K	
R3	501810320	R, "	2K	"	"	RN1/4-2K	
R4	501810410	R, "	10K	"	"	RN1/4-10K	
R5	501810510	R, "	100K	"	"	RN1/4-100K	
R6	501810320	R, "	2K	"	"	RN1/4-2K	
R7	501810410	R, "	10K	"	"	RN1/4-10K	
R8	501810510	R, "	100K	"	"	RN1/4-100K	
R9	501810320	R, "	2K	"	"	RN1/4-2K	
R10	501606711	R, "	390Ω	2W	±5%	RSF2B-390J	
R11	"	R, "	"	"	"	"	
R12	501810310	R, "	1K	1/4W	±1%	RN1/4-1K	
R13	501810330	R, "	3K	"	"	RN1/4-3K	
R14	501810510	R, "	100K	"	"	RN1/4-100K	
R15	501810310	R, "	1K	"	"	RN1/4-1K	
R16	501810330	R, "	3K	"	"	RN1/4-3K	
R17	501810510	R, "	100K	"	"	RN1/4-100K	
R18	501810310	R, "	1K	"	"	RN1/4-1K	
R19	501810330	R, "	3K	"	"	RN1/4-3K	
R20	501810310	R, "	1K	"	"	RN1/4-1K	
R21	501810322	R, "	2.2K	"	"	RN1/4-2.2K	
R22	"	R, "	"	"	"	"	For WX2300-1
R22	501810312	R, "	1.2K	"	"	RN1/4-1.2K	For WX2300-2
R23	501810447	R, "	47K	"	"	RN1/4-47K	
R24	501810410	R, "	10K	"	"	RN1/4-10K	
R25	501810447	R, "	47K	"	"	RN1/4-47K	
R26	501810510	R, "	100K	"	"	RN1/4-100K	
R27	501810410	R, "	10K	"	"	RN1/4-10K	
R28	501810447	R, "	47K	"	"	RN1/4-47K	
R29	"	R, "	"	"	"	"	
R30	501810510	R, "	100K	"	"	RN1/4-100K	
R31	501810282	R, "	820Ω	"	"	RN1/4-820F	
R32	501810310	R, "	1K	"	"	RN1/4-1K	
R33	501605734	R, "	15Ω	1W	±5%	RSF1B-15J	
R34	"	R, "	"	"	"	"	
R35	501810282	R, "	820Ω	1/4W	±1%	RN1/4-820F	
R36	501605714	R, "	390Ω	"	±5%	RSF1/2B-390J	
R39	505103036	R, Trimmer	100K			GF6X-100K	
R40	"	R, "	"			"	


+5V
+5
RA1 22K
R20 4.7K
RENEW UP
B7
R16 22K
470P C4
330K R3
R1 47K
R2 100K
C1 10μ
IC4
IC1
33K R14
SERVO ON
A1
EXT
CR7
RA1 22K
R19 22K
IC4
ON
SERVO
OFF
ON
B1
IN
CR6
470P C10
CHRT PEN ISO
B6
RA1 22K
R15 22K
C3 470P
IC2
IC3
CHART HOLD
A2
EXT
CR5
R18 22K
C7 470P
CHART
FREE
HOLD
B2
IN
IC4
PEN1 DOWN
A3
EXT
CR4
R8 22K
IC4
UP
DOWN
B3
IN
C6 470P
CR2
CR1
IC3
PEN 2 DOWN
A4
EXT
CR3
R9 22K
UP
DOWN
B4
IN
C9 470P
RA4 330K
R6 47K
R5 100K
6.8M
RA1 22K
+5V
PEN UP
A5
(RESET)
TIME SWEEP
R17 22K
C5 470P
IC4
IC1
C8



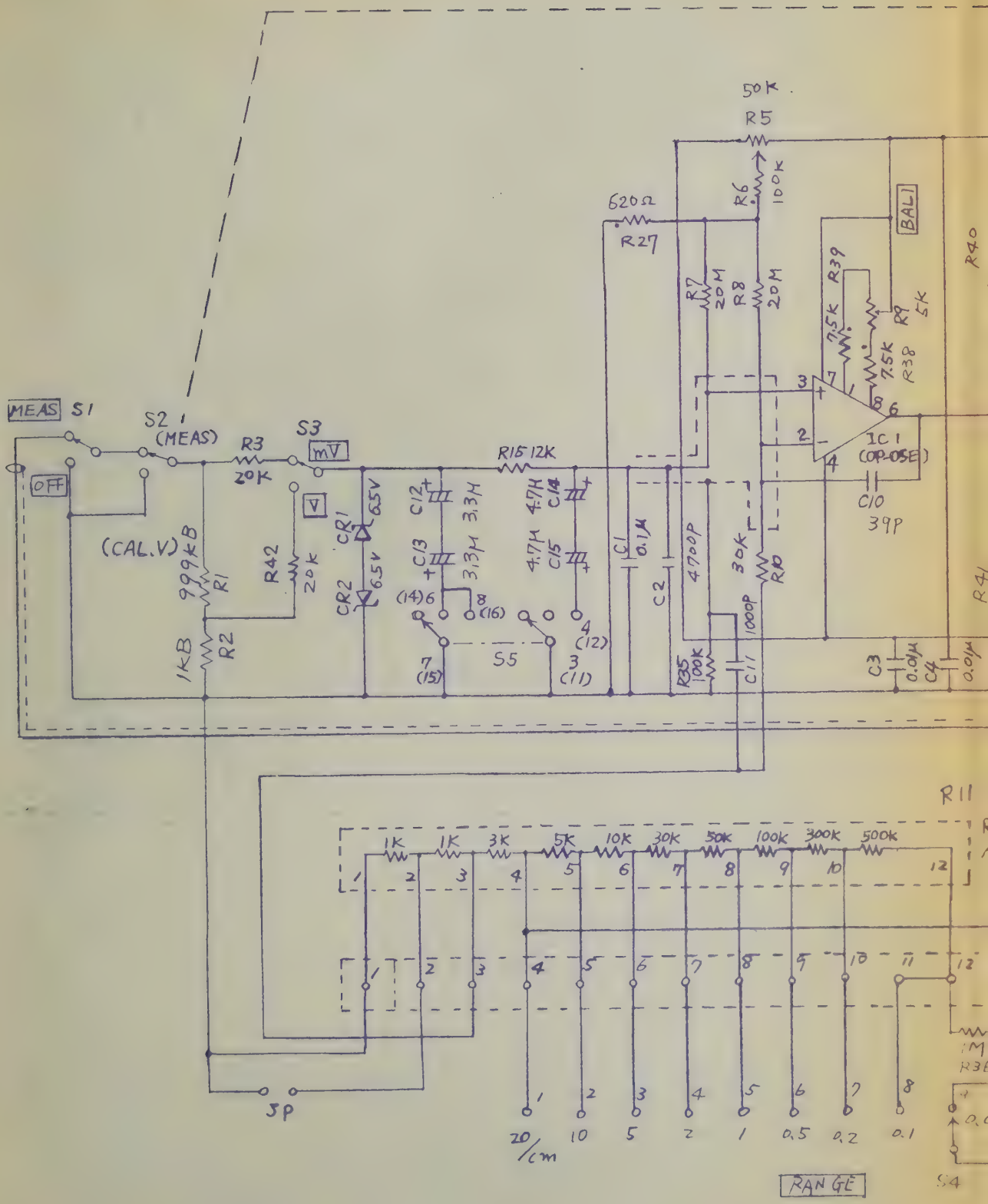
NOTE2) WX2300 CR2 : SHORT
CR6 : SHORT
RI2 : SHORT

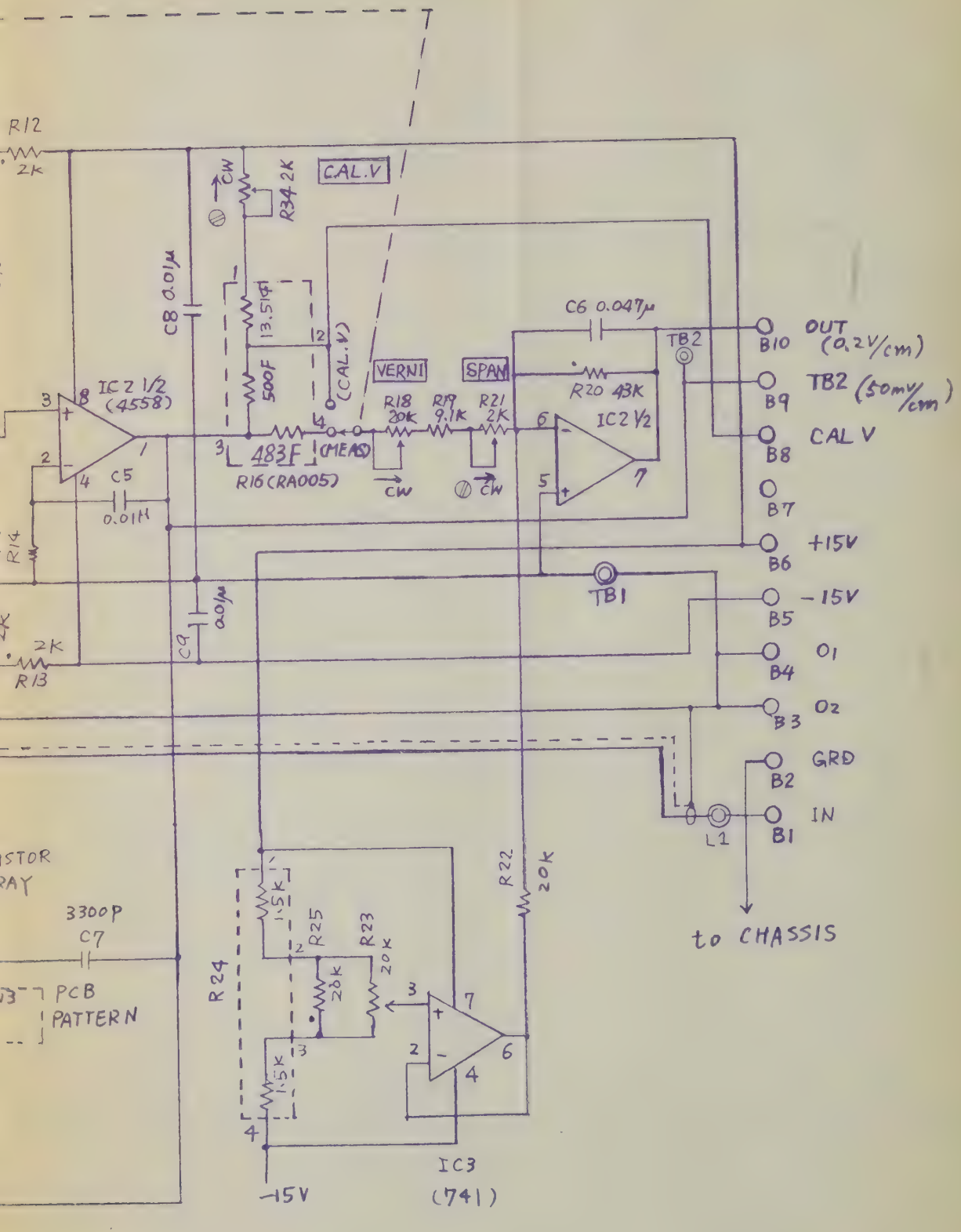
NOTE1) [ ] : For WX4309

		+5V	GND
IC1	SN 7406	14	7
IC2	TC4023	14	7
IC3	TC4081	14	7
IC4	TC4069	14	7

Figure	Part No.	Description	Type	Remarks
PCB	511430060	Printed Circuit Board	4301-054	
IC1	503300145	IC, TTL, Inverter NAND	SN7406N	
IC2	503300080	IC, CMOS, Triple 3-Input NAND	TC4023BP	
IC3	503303371	IC, " , Quad 2-Input AND	TC4081UBP	
IC4	503303364	IC, " , Hex Inverter	TC4069UBP	
IC5	503301064	IC, Voltage Regulator 5V	UPC78L05	
Q1	503203016	T, PNP −100mA 200mW	2SA1015, Y	
Q2	"	T, " " "	"	
CR3	503100020	Di, Si V_R = 30V I_F = 0.1A	IS953	
CR4	"	Di, " " "	"	
CR5	"	Di, " " "	"	
CR7	"	Di, " " "	"	
C1	502901007	C, Electrolytic 10μ 25WV	ECEA1ES100	
C2	"	C, " " "	"	
C3	502403006	C, Ceramic 470P 50WV	UFD06-Y-B-471K	
C4	"	C, " " "	"	
C5	"	C, " " "	"	
C6	"	C, " " "	"	
C7	"	C, " " "	"	
C8	502203007	C, Tantalum 6.8μ 20WV	CS15E1D6R8M	
C9	502403006	C, Ceramic 470P 50WV	UFD06-Y-B-471	
C10	"	C, " " "	"	
C11	502101014	C, Electrolytic 10μ 25WV	SM, 25T-10	
C12	502403007	C, Ceramic 0.01μ 50WV	ULD06-103-L2A	
RA1	501002816	Resistor Array 22Kx10	RM10-223J	
R1	501810447	R, Metal Film 47K 1/4W ±1%	RN1/4-47KF	
R2	501810510	R, " 100K " "	RN1/4-100KF	
R3	501810533	R, " 330K " "	RN1/4-330KF	
R4	"	R, " " " "	"	
R5	501810510	R, " 100K " "	RN1/4-100KF	
R6	501810447	R, " 47K " "	RN1/4-47KF	
R7	501810410	R, " 10K " "	RN1/4-10KF	
R8	501810422	R, " 22K " "	RN1/4-22KF	
R9	"	R, " " " "	"	
R10	501810324	R, " 2.4K " "	RN1/4-2.4KF	
R11	501810210	R, " 100Ω " "	RN1/4-100F	
R13	501810518	R, " 180K " "	RN1/4-180KF	
R14	501810433	R, " 33K " "	RN1/4-33KF	
R15	501810422	R, " 22K " "	RN1/4-22KF	

Figure	Part No.	Description	Type	Remarks
R16	501810422	R, Metal Film - 22K 1/4W ±1%	RN1/4-22KF	
R17	"	R, " " " "	"	
R18	"	R, " " " "	"	
R19	"	R, " " " "	"	
R20	501810347	R, ..." 4.7K " "	RN1/4-4.7KF	
K1	515100026	Relay, DC 12V	RRF51A12D, OKI	

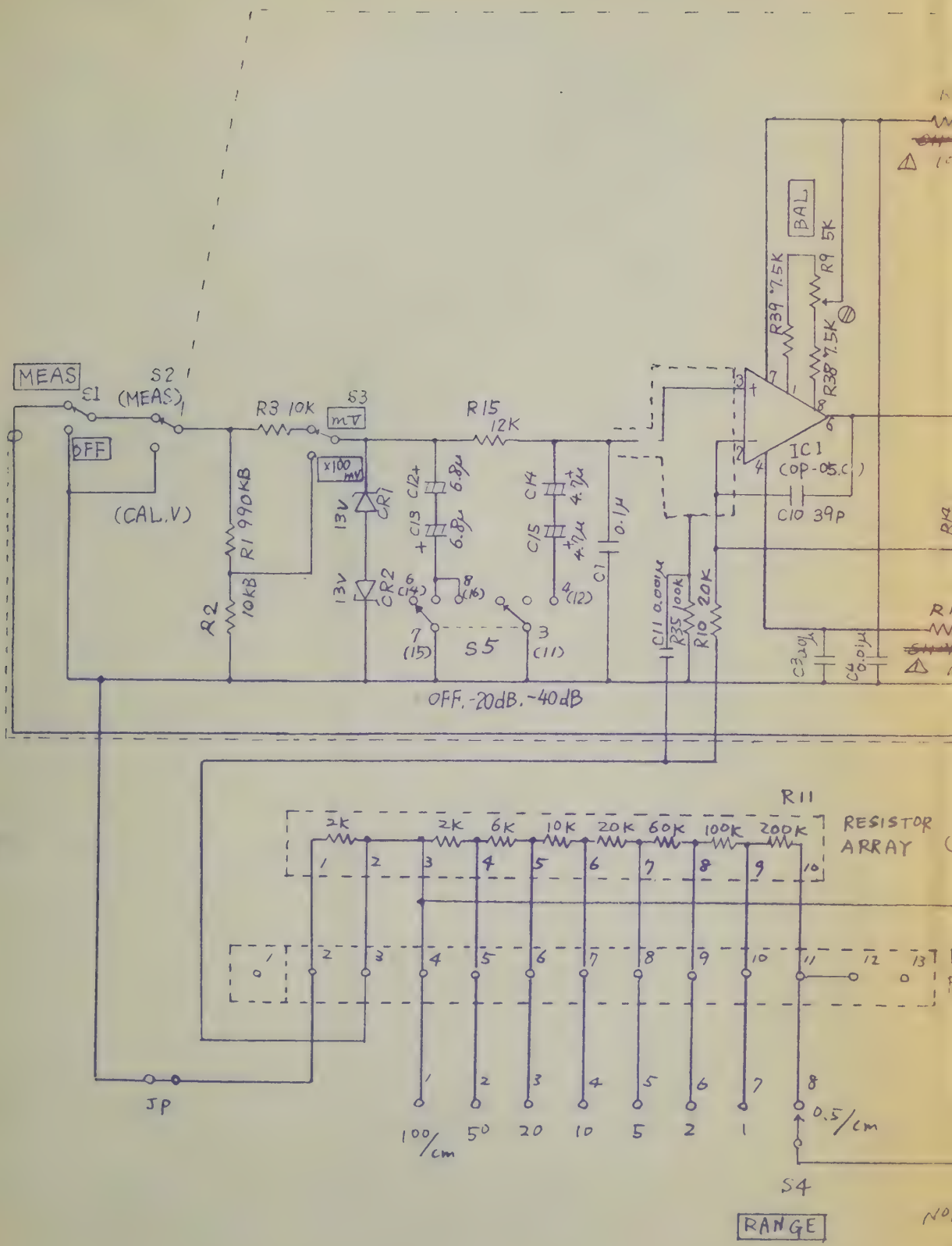

MEAS S1
S2 (MEAS)
S3
mV
V
OFF
(CAL.V)
999KΩ R1
1KΩ R2
R3 20K
R42 20K
CR1 6.5V
CR2 6.5V
C12 3.3μ
C13 3.3μ
C14 4.7μ
C15 4.7μ
S5
R15 12K
C1 0.1μ
C2 4700P
R35 100K
C11 1000P
50K R5
620Ω R27
R6 100K
R7 20M
R8 20M
R10 30K
BAL
R39 7.5K
R38 7.5K
R9 5K
IC1 (OP-05E)
C10 39P
C3 0.01μ
C4 0.01μ
R40
R41
R11
1K 1K 3K 5K 10K 30K 50K 100K 300K 500K
3P
20/cm 10 5 2 1 0.5 0.2 0.1
RANGE
S4

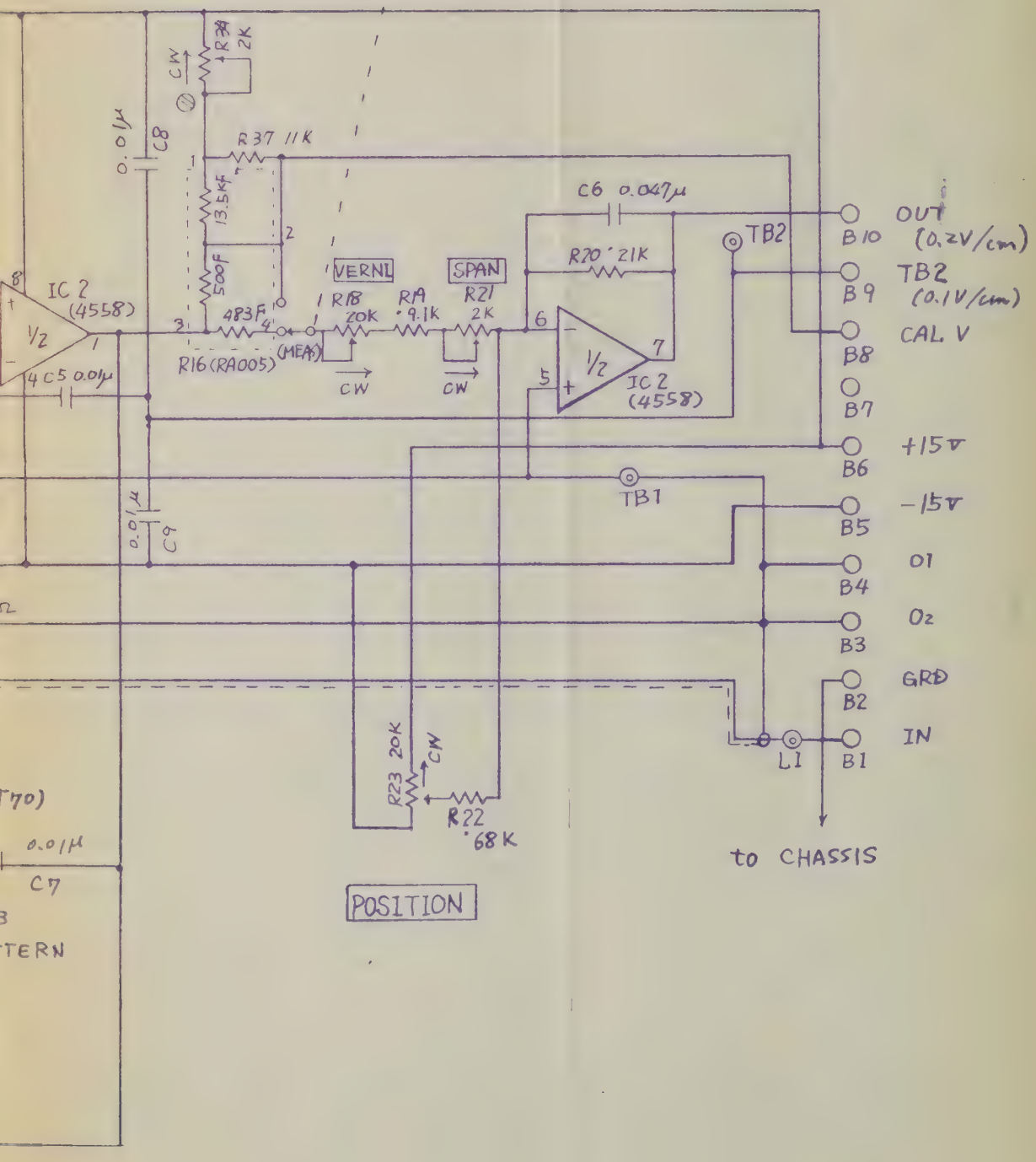

R12
2K
CW
R34 2K
CAL.V
C8 0.01μ
13.5KΩ
500Ω
(CAL.V)
VERNI
SPAN
C6 0.047μ
TB2
B10 OUT (0.2V/cm)
B9 TB2 (50mV/cm)
B8 CAL V
B7
B6 +15V
B5 -15V
B4 O1
B3 O2
B2 GRD
B1 IN
IC2 1/2 (4558)
C5 0.01M
R18 20K
R19 9.1K
R21 2K
R20 43K
IC2 V2
483F (MEAS)
R16 (RA0005)
CW
TB1
C9 20μ
R14
R13 2K
L1
to CHASSIS
R22 20K
R24
R25 20K
R23 20K
1.5K
3300P
C7
PCB PATTERN
IC3 (741)
-15V

Pre Amplifier Type Z

Figure	Part No.	Description	Type	Remarks
PCB	511670018	Printed Circuit Board	4000-06A	
S1	508301001	Switch, Slide	J-S4036-01-W	
S2	508302012	" "	J-S5089-01-W	
S3	508301001	" "	J-S4036-01-W	
S4	507111108	Switch, Rotary	J-R2000	
S5	508304003	Switch, Slide	SSA043L06	
TB1	513400027	Test Terminal	LC-1-G	
TB2	"	"	"	
IC1	503300007	IC, Op-Amp	Op-05E	
IC2	503300054	IC, Op-Amp, Dual	UPC4558C	
IC3	503300025	IC, Op-Amp	TA7504P	
CR1	503100035	Di, Zener 6.5V	WZ-065	
CR2	"	Di, " "	"	
C1	502303006	C, Myler Film 0.1μ 50WV	MFL-05P1	
C2	502303007	C, " 0.0047μ "	MFL-05D47	
C3	502403007	C, Ceramic 0.001μ "	ULD06-103-L2A	
C4	"	C, " " "	"	
C5	502303004	C, Myler Film 0.01μ "	MFL-05S1	
C6	502303005	C, " 0.047μ "	MFL-05S47	
C7	502303003	C, " 0.033μ "	MFL-05S33	
C8	502303004	C, " 0.01μ "	MFL-05S1	
C9	"	C, " " "	"	
C10	502403008	C, Ceramic 39P "	UDS04SL390K-K2J	
C11	502303002	C, Myler Film 0.001μ "	MFL-05D1	
C12	502204003	C, Tantalum 3.3μ 16WV	CS151C3R3M1S-A	
C13	"	C, " " "	"	
C14	502204002	C, " 4.7μ "	CS151C4R7M1S-A	
C15	"	C, " " "	"	
R1	501503204	R, Metal Film 999K 1/4W ±0.1%	RN65E999KB	
R2	501502202	R, " 1K 1/8W "	RN60E1KB	
R3	501810420	R, " 20K 1/4W ±1%	RN1/4-20KF	
R5	505103024	R, Trimmer, Cermet 50K	GF6X-5K	
R6	501443651	R, Metal Film 100K 1/4W ±1%	RP44C100KF	
R7	501502216	R, Metal Glaze 20M 1/8W ±10%	RH1/8HVS20MK	
R8	"	R, " " " "	"	
R9	505101026	R, Trimmer, Cermet, Multi-Turn 5K	RJ20P-5K	
R10	501810430	R, Metal Film 30K 1/4W ±1%	RN1/4-30KF	
R11	501003307	R, Array ±0.1%	GT36	
R12	501443631	R, Metal Film 2K 1/4W ±1%	RP44C2KF	

Figure	Part No.	Description	Type	Remarks
R13	501443631	R, Metal Film 2K 1/4W ±1%	RP44C2KF	
R14	501810310	R, " 1K " "	RN1/4-1KF	
R15	501810412	R, " 12K " "	RN1/4-12KF	
R16	501002809	R, Array	RA005	
R18	504105006	R, Variable, Cermet 20K	GFP161-20SB20K	
R19	501443608	R, Metal Film 9.1K 1/4W ±1%	RP44C9.1KF	
R20	501443609	R, " 43K " "	RP44C43KF	
R21	505103009	R, Trimmer, Cermet 2K	GF6X-2K	
R22	501443614	R, Metal Film 20K 1/4W ±1%	RP44C20KF	
R23	504105007	R, Potentiometer, Multi-turn 20K	M1305-20K	
R24	501003309	R, Array 1.5Kx2 ±0.1%	RA940	
R25	501443614	R, Metal Film 20K 1/4W ±1%	RP44C20KF	
R27	501443602	R, " 620K " "	RP44C620F	
R34	505103009	R, Trimmer, Cermet 2K	GF6X-2K	
R35	501810510	R, Metal Film 100K 1/4W ±1%	RN1/4-100KF	
	515100019	Knob ϕ10mm, Black	020-212	For R23
	516100016	" " " with Line	021-222	For S4
	516100017	Cap ϕ10mm, Black	040-102	For R23
	516100018	" " " with Line	040-162	For S4
R36	501503201	R, Metal Film 1M 1/4W ±0.1%	RN65E1MB	
R38	501443603	R, " 7.5K " ±1%	RP44C7.5KF	
R39	"	R, " " " "	"	
R40	501443631	R, " 2K " "	RP44C2KF	
R41	"	R, " " " "	"	
R42	501443614	R, " 20K " "	RP44C20KF	


MEAS
S2
E1
(MEAS)
OFF
(CAL.V)
R3 10K
S3
mV
x100 mV
R15 12K
R1 990KΩ
R2 10KΩ
CR1 13V
CR2 13V
C12 6.8μ
C13 6.8μ
C14 4.7μ
C15 4.7μ
C1 0.1μ
C11 0.001μ
R35 100K
R10 20K
S5
OFF, -20dB, -40dB
IC1 (op-05.c)
C10 39P
C3 1μ
C4 0.01μ
BAL
R9 5K
R39 7.5K
R38 7.5K
R11
RESISTOR ARRAY
2K 2K 6K 10K 20K 60K 100K 200K
JP
100/cm 50 20 10 5 2 1 0.5/cm
S4
RANGE



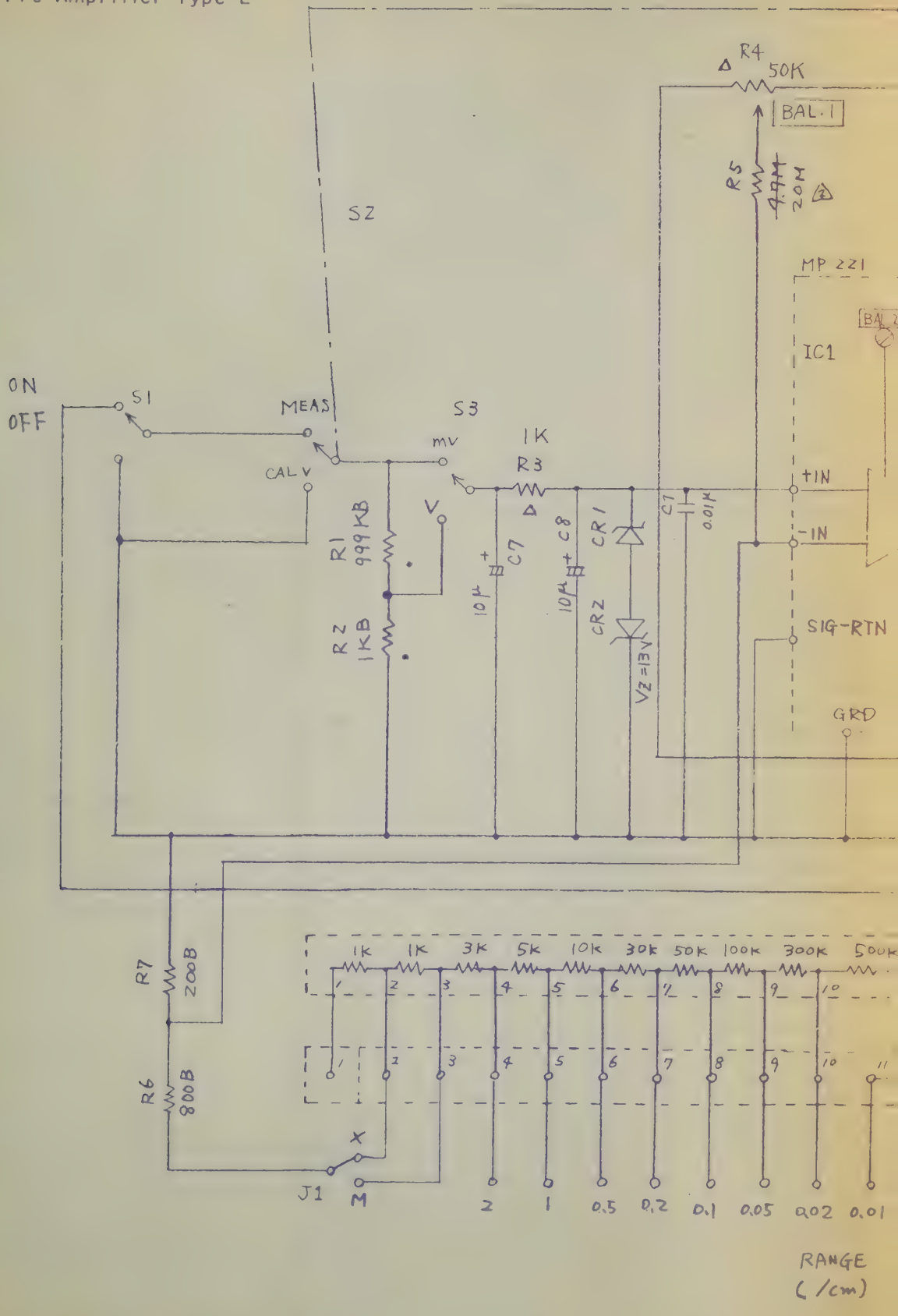
2) R12, R13 : SHORT

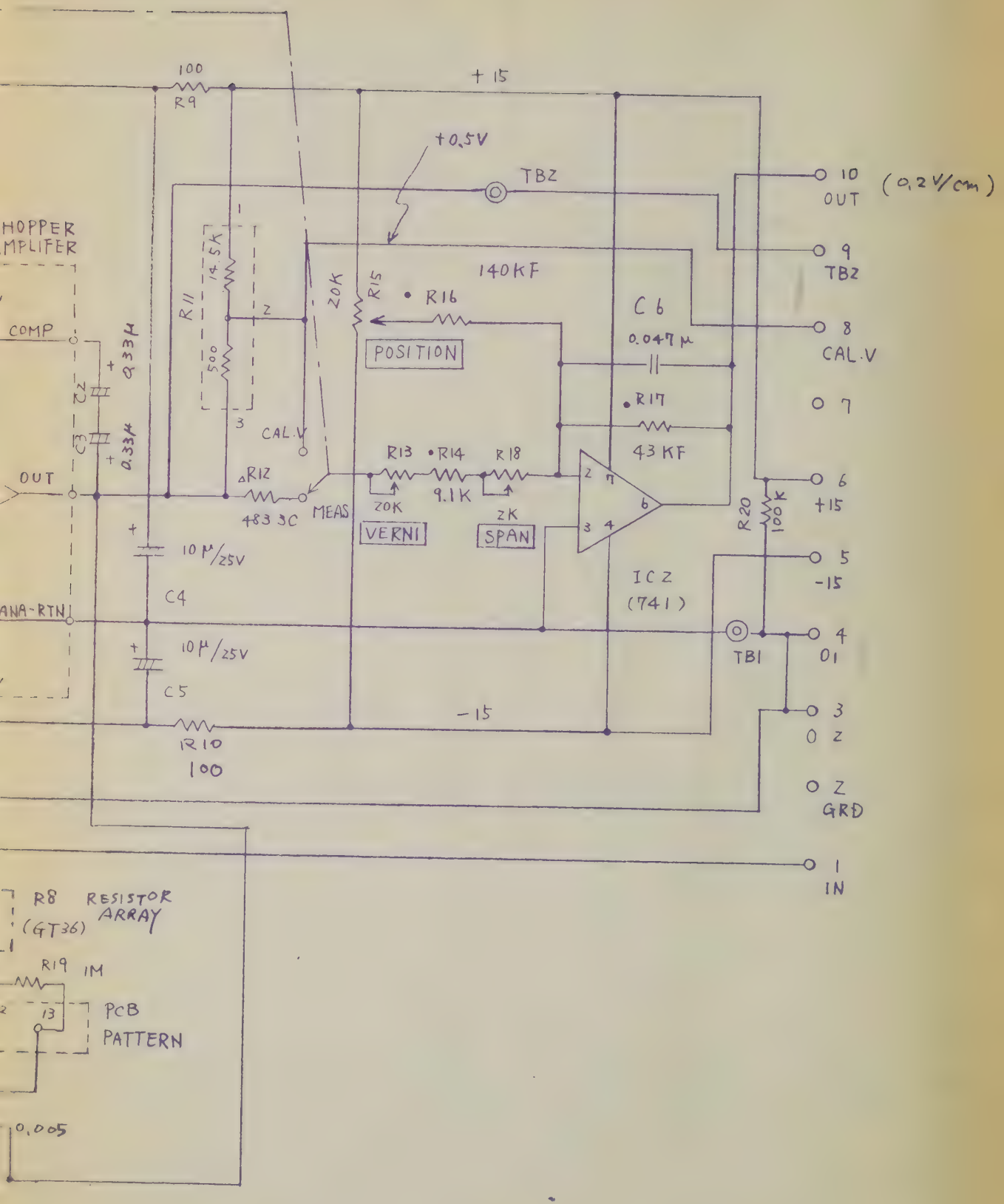
1) SYMBOL • 50ppm/°C

Pre Amplifier Type L

Figure	Part No.	Description	Type	Remarks
PCB	511400080	Printed Circuit Board	4000-06A	
S1	508301001	Switch, Slide	J-S4036-01-W	
S2	508302012	" "	J-S5089-01-W	
S3	508301001	" "	J-S4036-01-W	
S4	507111108	Switch, Rotary	J-R2000	
S5	508304003	Switch, Slide	SSA043L06	
TB1	513400027	Test Terminal	LC-1-G	
TB2	"	"	"	
IC1	503300006	IC, Op-Amp	OP-05C	
IC2	503300054	IC, Op-Amp, Dual	UPC4558C	
CR1	503100035	Di, Zener 6.5V	WZ-065	
CR2	"	Di " "	"	
C1	502303006	C, Myler Film 0.01μ 50WV	MFL-05P1	
C3	502403007	C, Ceramic 0.001μ "	ULD06-103-L2A	
C4	"	C, " " "	"	
C5	502303004	C, Myler Film 0.01μ "	MFL-05S1	
C6	502303005	C, " 0.047μ "	MFL-05S47	
C7	502303004	C, " 0.01μ "	MFL-05S1	
C8	"	C, " " "	"	
C9	"	C, " " "	"	
C10	502403008	C, Ceramic 39P "	USD04SL390K-K2J	
C11	502303002	C, Myler Film 0.001μ "	MFL-05D1	
C12	502204001	C, Tantalum 6.8μ 16WV	CS15E1C6R8M1S-A	
C13	"	C, " " "	"	
C14	502204002	C, " 4.7μ "	CS15E1C4R7M1S-A	
C15	"	C, " " "	"	
R1	501503202	R, Metal Film 990K 1/4W ±0.1%	RN65E990KB	
R2	501502204	R, " 10K 1/8W "	RN60E10KB	
R3	501810410	R, " 10K 1/4W ±1%	RN1/4-10KF	
R9	505101026	R, Trimmer, Cermet, Multi-Turn 5K	RJ20P-5K	
R10	501810420	R, Metal Film 20K 1/4W ±1%	RN1/4-20KF	
R11	501003320	R, Array ±0.2%	GT-70	
R12	501810210	R, Metal Film 100Ω 1/4W ±1%	RN1/4-100F	
R13	"	R, " " " "	"	
R14	501810310	R, Array 1K " "	RN1/4-1KF	
R15	505101026	R, Metal Film 12K " "	RN1/4-12KF	
R16	501002809	R, Array "	RA005	
R18	504105006	R, Variable, Cermet 20K	GFP161-20SB20K	
R19	501443608	R, Metal Film 9.1K 1/4W ±1%	RP44C9.1KF	

Figure	Part No.	Description	Type	Remarks
R20	501443516	R, Metal Film 21K 1/4W ±1%	RP44C21KF	
R21	505103009	R, Trimmer, Cermet 2K	GF6X-2K	
R22	501443613	R, Metal Film 68K 1/4W ±1%	RP44C68KF	
R23	504105007	R, Potentiometer, Multi-turn 20K	M1305-20K	
R34	504103009	R, Trimmer, Cermet 2K	RF6X-2K	
R35	501810510	R, Metal Film 100K 1/4W ±1%	RN1/4-100KF	
R37	501810411	R, Metal Film 11K " "	RN1/4-11KF	
R38	501443603	R, " 7.5K " "	RP44C7.5KF	
R39	"	R, " " " "	"	
	516100019	Knob φ10mm, Black	020-212	For R23
	516100016	" " " with Line	021-222	For S4
	516100017	Cap φ10mm, Black	040-102	For R23
	516100018	" " " with Line	040-162	For S4


R4
50K
BAL.1
R5
4.9M
20M
S2
MP 221
IC1
ON
OFF
S1
MEAS
S3
mv
1K
R3
CAL V
V
+IN
-IN
R1
999KB
R2
1KB
10μ
C7
10μ
C8
CR1
CR2
V2=13V
C7
0.01K
SIG-RTN
GRD
R7
200B
R6
800B
1K
1K
3K
5K
10K
30K
50K
100K
300K
500K
X
J1
M
2
1
0.5
0.2
0.1
0.05
0.02
0.01
RANGE
(/cm)

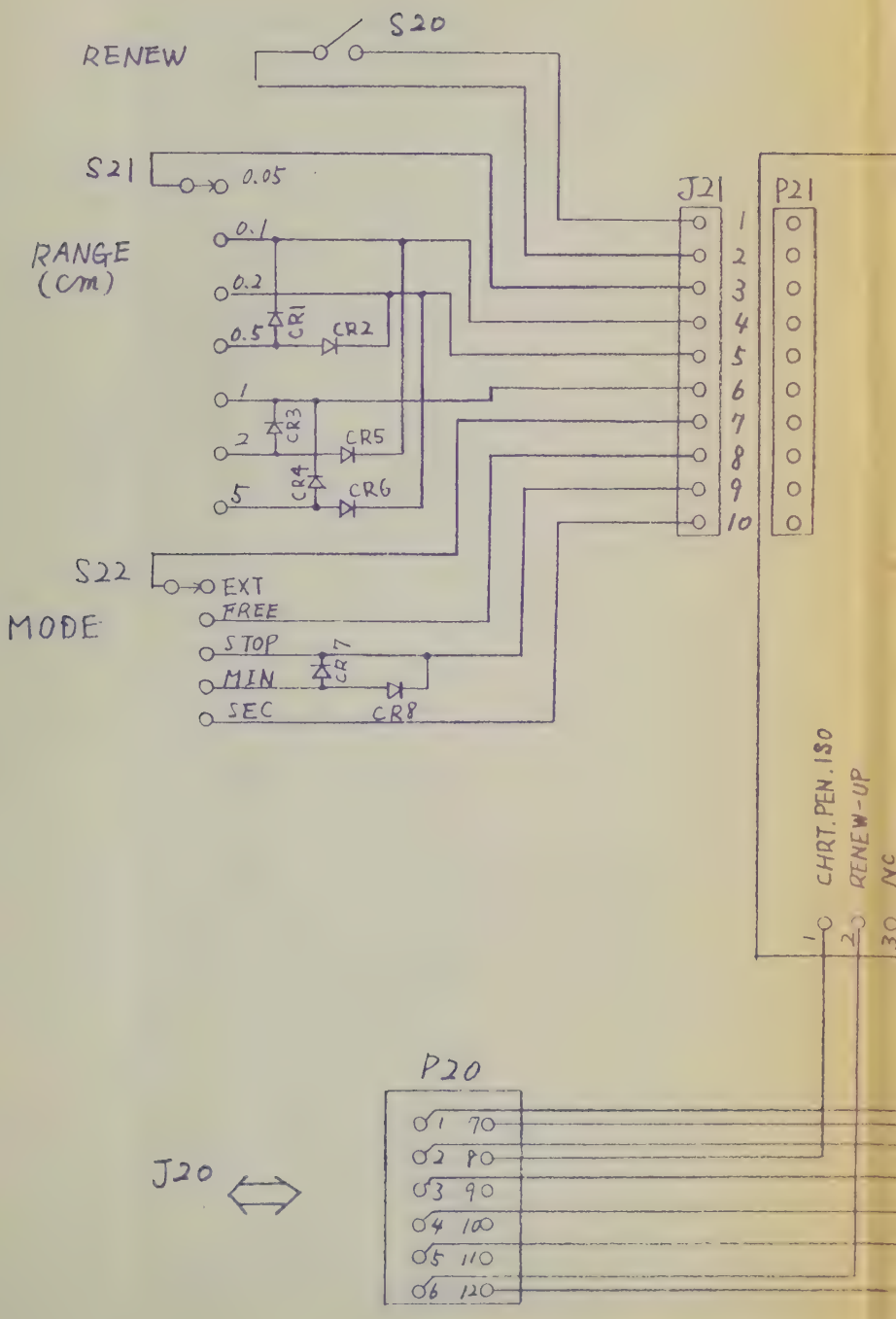

100
R9
+15
+0.5V
TBZ
10
OUT
(0.2V/cm)
HOPPER
MPLIFER
9
TBZ
140KF
20K
R15
R16
C6
0.047μ
8
CAL.V
COMP
POSITION
R11
14.5K
500
2
3
CAL.V
R17
43 KF
7
0.33μ
0.33μ
C3
C2
R13
R14
R18
OUT
ΔR12
483 3C
MEAS
20K
9.1K
2K
6
+15
VERNI
SPAN
R20
100K
10μ/25V
C4
5
-15
IC 2
(741)
ANA-RTN
10μ/25V
C5
TBI
4
01
-15
3
0 2
R10
100
2
GRD
1
IN
R8 RESISTOR
ARRAY
(GT36)
R19 1M
13
PCB
PATTERN
0.005

Pre Amplifier Type E

Figure	Part No.	Description	Type	Remarks
PCB	511661012	Printed Circuit Board	E-AMP-A	
IC1	503400006	IC, Chopper Amp	MP221	
IC2	503300025	IC, Op-Amp	TA7504P	
TB1	513400027	Test Terminal	LC-1-G	
TB2	〃	〃	〃	
S1	508302012	Switch, Slide	J-S5089-01W	
S2	〃	〃 〃	J-S5089-01W	
S3	508301001	〃 〃	J-S4036-01W	
S4	507111108	Switch, Rotary	J-R2000	
CR1	503100005	Di, Zener 13V 0.5W	WZ130	
CR2	〃	Di, 〃 〃 〃	〃	
C1	502403007	C, Ceramic 0.01μ 50WV	ULD06-103-L2A	
C2	502203025	C, 〃 0.33μ 35WV	CS15E1V0R33M	
C3	〃	C, 〃 〃 〃	〃	
C4	502203018	C, Tantalum 10μ 25WV	CS15E1E100M	
C5	〃	C, 〃 〃 〃	〃	
C6	502303005	C, Myler Film 0.047μ 50WV	MFL-05S47	
C7	502203018	C, Tantalum 10μ 25WV	CS15E1E100M	
C8	〃	C, 〃 〃 〃	〃	
R1	501503204	R, Metal Film 999K 1/4W ±0.1%	RN65E990KB	
R2	501502202	R, 〃 1K 1/8W 〃	RN60E1KB	
R3	501810310	R, 〃 〃 1/4W ±1%	RN1/4-1KF	
R4	505101016	R, Trimmer, Cermet, Multi-turn 20K	RJ20P-50K	
R5	501502224	R, Metal Glaze 20M 1/8W ±10%	RH1/8HVD20MK	
R6	501502223	R, Metal Film 800 〃 ±0.1%	RN60E800B	
R7	501502222	R, 〃 200 〃 〃	RN60E200B	
R8	501003307	R, Array	GT36	
R9	501810210	R, Metal Film 100 1/4W ±1%	RN1/4-100F	
R10	〃	R, 〃 〃 〃 〃	〃	
R11	501003308	R, Array	RA939	
R12	501433303	R, Metal Film 483.3 1/4W ±0.25%	RP42A483.3C	
R13	504105006	R, Variable, Cermet 20K	GFP161-20SB20K	
R14	501443716	R, Metal Film 9.1K 1/4W ±5%	RP42C9.1KJ	
R15	504105007	R, Potentiometer, Multi-turn 20K	M1305-20K	
R16	501443717	R, Metal Film 240K 1/4W ±5%	RP42C240KJ	
R17	501443509	R, 〃 43K 〃 ±1%	RP42C43KF	
R18	505103009	R, Trimmer, Cermet 2K	GF6X-2K	
R19	501503201	R, Metal Film 1M 1/4W ±0.1%	RN65E1MB	
R20	501810510	R, 〃 100K	RN1/4-100KF	

Figure	Part No.	Description	Type	Remarks
	516100019	Knob ϕ10mm, Black	020-212	For R15
	516100016	" " " with Line	021-222	For S4
	516100017	Cap ϕ10mm, Black	040-102	For R15
	516100018	" " " with Line	040-162	For S4
	516100011	" " "	PN7089-2	For S2

5－16 Chart Driver Wiring Diagram



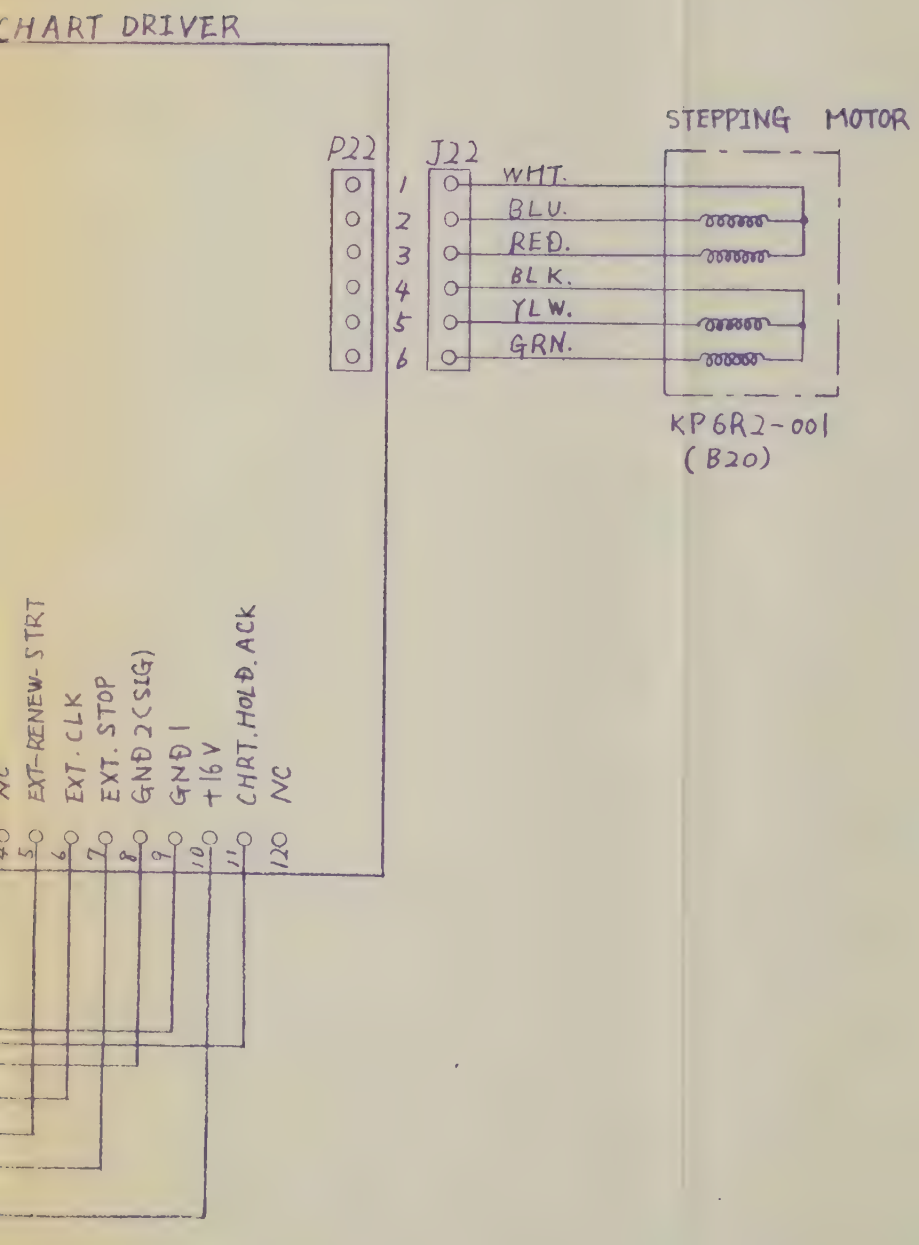


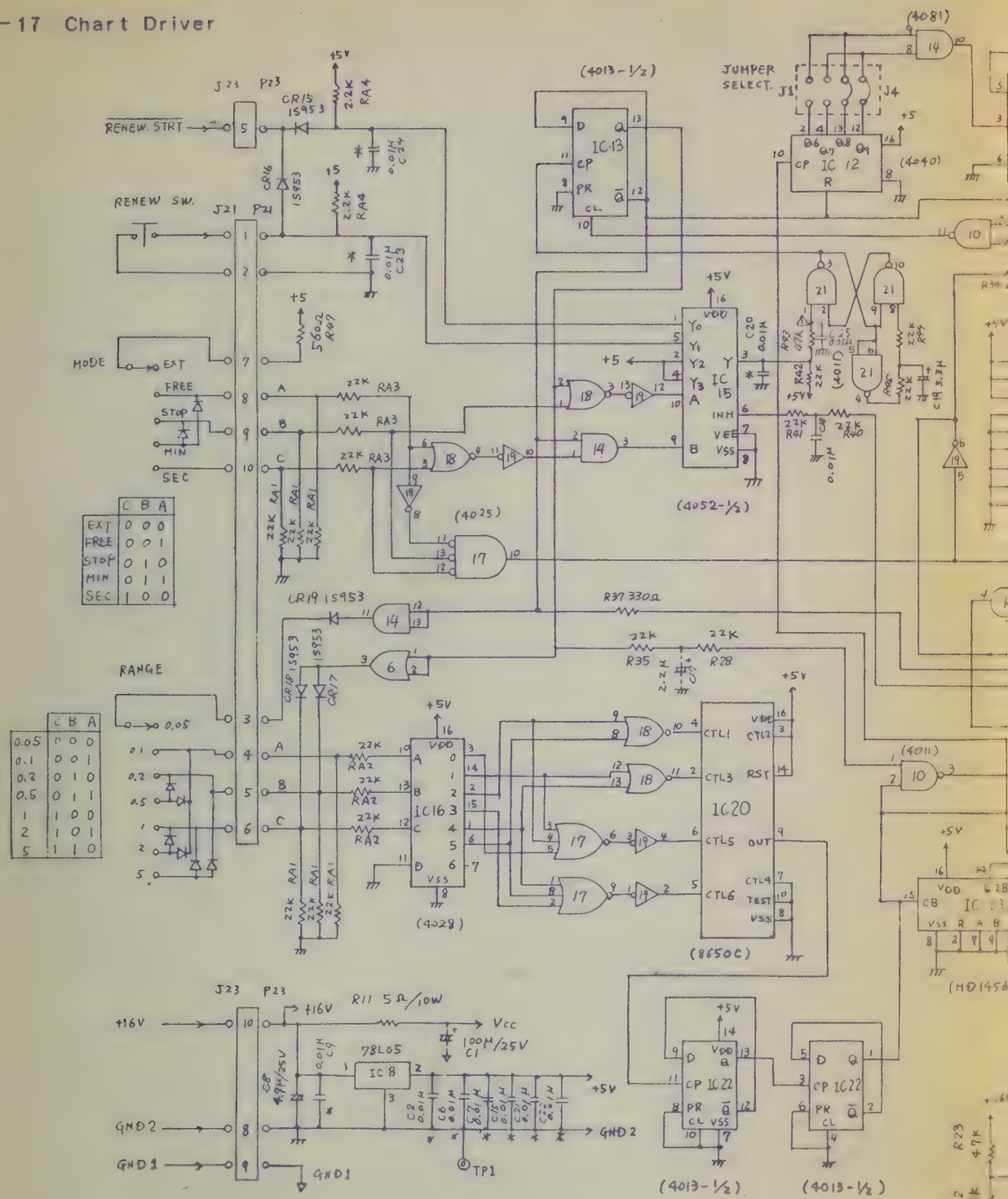
CHART DRIVER
P22
J22
1
2
3
4
5
6
WHT.
BLU.
RED.
BLK.
YLW.
GRN.
STEPPING MOTOR
KP6R2-001
(B20)
EXT-RENEW-STRT
EXT. CLK
EXT. STOP
GND 2(SIG)
GND 1
+16V
CHRT.HOLD.ACK
NC
5
6
7
8
9
10
11
12

:hart Drive Wiring Diagram

Figure	Part No.	Description	Type	Remarks
B20	509400004	Stepping Motor	KP6R2-001	
S20	508201021	Switch, Push	1F-2U-0A	
S21	508204005	Switch, Rotary	M-117-15R-R	
S22	508204004	" "	SRM1025-15R-R	
CR1	503100020	Di, Si V_R = 30V I_F = 100mA	1S953	
CR2	"	Di, " " "	"	
CR3	"	Di, " " "	"	
CR4	"	Di, " " "	"	
CR5	"	Di, " " "	"	
CR6	"	Di, " " "	"	
CR7	"	Di, " " "	"	
CR8	"	Di, " " "	"	
J21	513400072	Connector, Receptacle 10P	HNC2-2.5S-10	
J22	513400036	Connector, Receptacle 6P	HNC2-2.5S-6	
CNP	513400037	Contact Pin	HNC2.5S-A	x16 For J21,J22

hart Drive Wiring Diagram

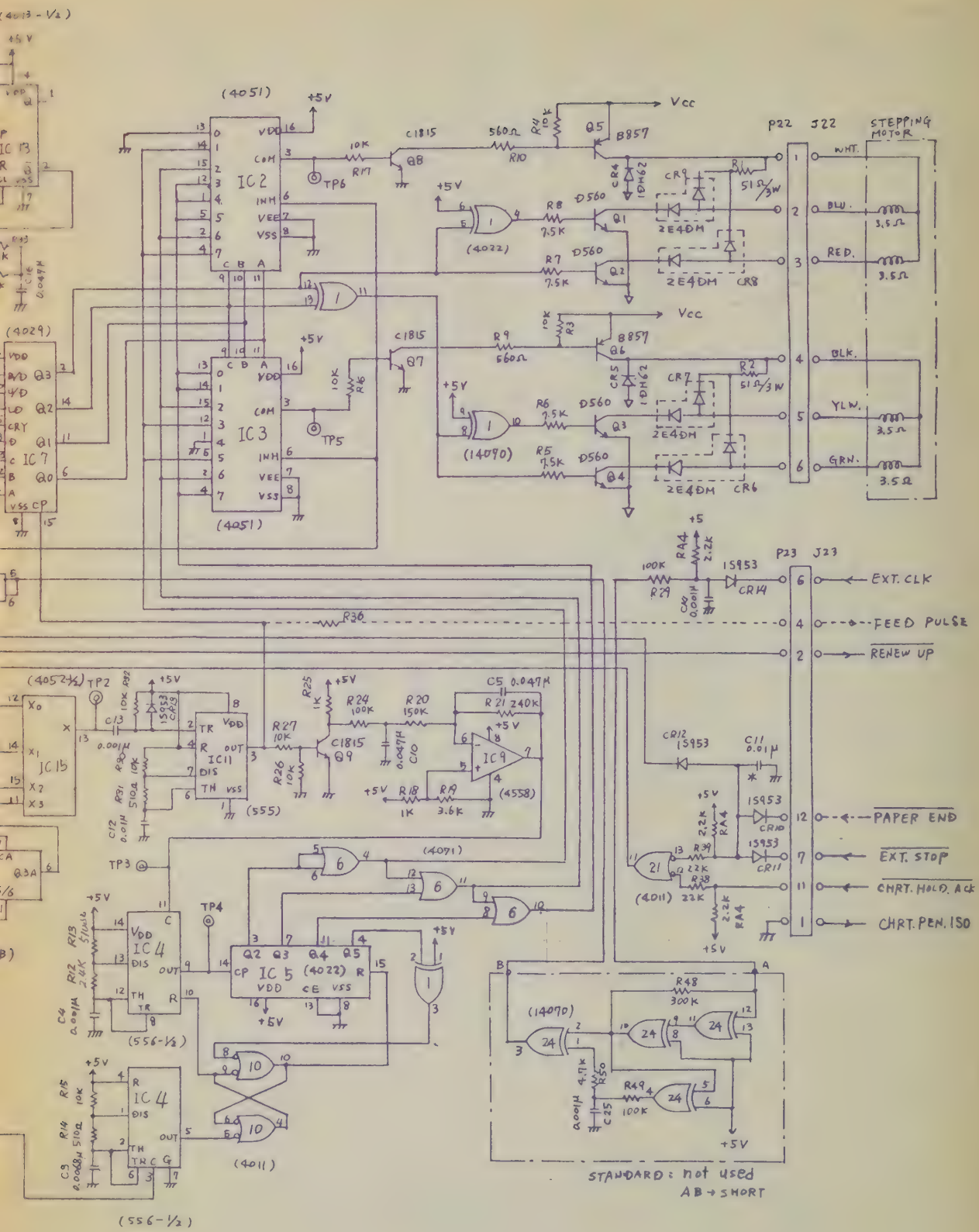
Figure	Part No.	Description	Type	Remarks
B20	509400004	Stepping Motor	KP6R2-001	
S20	508201021	Switch, Push	1F-2U-0A	
S21	508204005	Switch, Rotary	M-117-15R-R	
S22	508204004	" "	SRM1025-15R-R	
CR1	503100020	Di, Si V_R = 30V I_F = 100mA	1S953	
CR2	"	Di, " " "	"	
CR3	"	Di, " " "	"	
CR4	"	Di, " " "	"	
CR5	"	Di, " " "	"	
CR6	"	Di, " " "	"	
CR7	"	Di, " " "	"	
CR8	"	Di, " " "	"	
J21	513400072	Connector, Receptacle 10P	HNC2-2.5S-10	
J22	513400036	Connector, Receptacle 6P	HNC2-2.5S-6	
CNP	513400037	Contact Pin	HNC2.5S-A	x16 For J21,J22



	C	B	A
EXT	0	0	0
FREE	0	0	1
STOP	0	1	0
MIN	0	1	1
SEC	1	0	0

	C	B	A
0.05	0	0	0
0.1	0	0	1
0.2	0	1	0
0.5	0	1	1
1	1	0	0
2	1	0	1
5	1	1	0

		+5V	GND
IC 19	TC4069UBP	14	7
IC 1.24	HD14070B	14	7
IC 18	TC4001BP	14	7
IC 17	TC4025BP	14	7
IC 6	TC4071BP	14	7
IC 10.21	TC4011BP	14	7
IC 14	TC4081BP	14	7



C1, C17, R36 : not used

Figure	Part No.	Description	Type	Remarks
PCB	511240010	Printed Circuit Board	2300-10	
IC1	503302078	IC, CMOS Quad EX-OR	HD14070B	
IC2	503300113	IC, " 8CH Multiplexer	TC4051BP	
IC3	"	IC, " " "	"	
IC4	503300035	IC, Dual Timer	NE556	
IC5	503300105	IC, CMOS Divide-by-8 Counter	TC4022BP	
IC6	503300106	IC, " Quad 2-Input OR	TC4071BP	
IC7	503300107	IC, " Up/Down Counter	TC4029BP	
IC8	503301064	IC, Voltage Regulator 5V	UPC78L05	
IC9	503300054	IC, Quad Op-Amp	UPC4558C	
IC10	503300062	IC, CMOS 2-Input NAND	TC4011BP	
IC11	503300030	IC Single Timer	NE555	
IC12	503303348	IC, CMOS BCD to Decimal Divider	TC4040UBP	
IC13	503300064	IC, " Dual D-Flip Flop	TC4013BP	
IC14	503303371	IC, " Quad 2-Input AND	TC4081UBP	
IC15	503303356	IC, " Dual 4CH Multiplexer	TC4052BP	
IC16	503303339	IC, " BCD to Decimal Divider	TC4028BP	
IC17	503303337	IC, " Triple 3-Input NOR	TC4025BP	
IC18	503300124	IC, " Quad 2-Input NOR	TC4001BP	
IC19	503303364	IC, " Hex Inverter	TC4069UBP	
IC20	503302076	IC, Programmable Counter	TC8650-C	
IC21	503300062	IC, CMOS Quad 2-Input NAND	TC4011BP	
IC22	503300064	IC, " Dual D-Flip Flop	TC4013BP	
IC23	503302077	IC, " Divid-by-60 Counter	HD14566BP	
CR4	503100062	Di, Si	1DH62	
CR5	"	Di, "	"	
CR6	503100063	Di, " V_R = 200V I_F = 1.5A	2E4DM	
CR7	"	Di, " " "	"	
CR8	"	Di, " " "	"	
CR9	"	Di, " " "	"	
CR10	503100020	Di, " V_R = 30V I_F = 100mA	1S953	
CR11	"	Di, " " "	"	
CR12	"	Di, " " "	"	
CR13	"	Di, " " "	"	
CR14	"	Di, " " "	"	
CR15	"	Di, " " "	"	
CR16	"	Di, " " "	"	
CR17	"	Di, " " "	"	
CR18	"	Di, " " "	"	
CR19	"	Di, " " "	"	
Q1	503200028	Tr, NPN 5A 30W	2SD560	
Q2	"	Tr, " " "	"	

Figure	Part No.	Description			Type	Remarks
Q3	503200028	Tr, NPN	5A	30W	2SD560	
Q4	"	Tr, "	"	"	"	
Q5	503203021	Tr, PNP	−4A	40W	2SB857	
Q6	"	Tr, "	"	"	"	
Q7	503203014	Tr, NPN	100mA	200mW	2SC1815	
Q8	"	Tr, "	"	"	"	
Q9	"	Tr, "	"	"	"	
C2	502403007	C, Ceramic	0.01μ	50WV	ULD06-103-L2A	
C3	502303013	C, Myler Film	0,0068μ	"	MFL-05D68	
C4	502303002	C, "	0.001μ	"	MFL-05D1	
C5	502303005	C, "	0.047μ	"	MFL-05S47	
C6	502403007	C, "	0.001μ	"	ULD06-103-L2A	
C7	"	C, "	"	"	"	
C8	502103027	C, Electrolytic	4.7μ	25WV	SM25VB-4.7	
C9	502403007	C, Ceramic	0.01μ	50WV	ULD06-103-L2A	
C10	502303005	C, Myler Film	0.047μ	"	MFL-05S47	
C11	502403007	C, Ceramic	0.01μ	"	ULD06-103-L2A	
C12	502303004	C, Myler Film	0.01μ	"	MFL-05S1	
C13	502303002	C, "	0.001μ	"	MFL-05D1	
C14	"	C, "	"	"	"	
C15	502403007	C, Ceramic	0.01μ	"	ULD06-103-L2A	
C16	502303005	C, Myler Film	0.047μ	"	MFL-05S47	
C18	502303004	C, Ceramic	0.01μ	"	MFL-05S1	
C19	502203003	C, Tantalum	3.3μ	16WV	CS15E1C3R3M	
C20	502403007	C, Ceramic	0.01μ	50WV	ULD06-103-L2A	
C21	"	C, "	"	"	"	
C22	"	C, "	"	"	"	
C23	"	C, "	"	"	"	
C24	"	C, "	"	"	"	
C25	"	C, "	"	"	"	
RA1	501003322	R, Array	22Kx6		EXBP86-223M	
RA2	501003323	R, "	22Kx3		EXBT43-223M	
RA3	"	R, "	"		"	
RA4	501002824	R, "	2.2Kx5		EXBP85-222M	
R1	501609715	R, Wire-wound	51Ω	3W	±5%	MU3P-51J
R2	"	R, "	"	"	"	"
R3	501810410	R, Metal Film	10K	1/4W	±1%	RN1/4-10KF
R4	"	R, "	"	"	"	"
R5	501810375	R, "	7.5K	"	"	RN1/4-7.5KF
R6	"	R, "	"	"	"	"
R7	"	R, "	"	"	"	"
R8	"	R, "	"	"	"	"

Figure	Part No.	Description				Type	Remarks
R9	501810256	R, Metal Film	560Ω	1/4W	±1%	RN1/4-560F	
R10	"	R, "	"	"	"	"	
R11	501609725	R, Wire-wound	5Ω	10W	±5%	MU10P-5J	
R12	501810324	R, Metal Film	2.4K	1/4W	±1%	RN1/4-2.4KF	
R13	501810251	R, "	510Ω	"	"	RN1/4-510F	
R14	501810251	R, "	"	"	"	"	
R15	501810410	R, "	10K	"	"	RN1/4-10KF	
R16	"	R, "	"	"	"	"	
R17	"	R, "	"	"	"	"	
R18	501810310	R, "	1K	"	"	RN1/4-1KF	
R19	501810336	R, "	3.6K	"	"	RN1/4-3.6KF	
R20	501810515	R, "	150K	"	"	RN1/4-150KF	
R21	501810524	R, "	240K	"	"	RN1/4-240KF	
R22	501810311	R, "	1.1K	"	"	RN1/4-1.1KF	
R23	501810347	R, "	4.7K	"	"	RN1/4-4.7KF	
R24	501810510	R, "	100K	"	"	RN1/4-100KF	
R25	501810310	R, "	1K	"	"	RN1/4-1KF	
R26	501810410	R, "	10K	"	"	RN1/4-10KF	
R27	"	R, "	"	"	"	"	
R28	501810422	R, "	22K	"	"	RN1/4-22KF	
R29	501810510	R, "	100K	"	"	RN1/4-100KF	
R30	501810410	R, "	10K	"	"	RN1/4-10KF	
R31	501810251	R, "	510Ω	"	"	RN1/4-510F	
R32	501810410	R, "	10K	"	"	RN1/4-10KF	
R33	501810422	R, "	22K	"	"	RN1/4-22KF	
R34	"	R, "	"	"	"	"	
R35	"	R, "	"	"	"	"	
R37	501810233	R, "	330Ω	"	"	RN1/4-330F	
R38	501810422	R, "	22K	"	"	RN1/4-22KF	
R39	"	R, "	"	"	"	"	
R40	"	R, "	"	"	"	"	
R41	"	R, "	"	"	"	"	
R42	"	R, "	"	"	"	"	
R43	501810447	R, "	47K	"	"	RN1/4-47KF	
R44	501810422	R, "	22K	"	"	RN1/4-22KF	
R45	"	R, "	"	"	"	"	
R47	501810256	R, "	560Ω	"	"	RN1/4-560F	
TP1	513400027	Test Terminal				LC-1-G	
TP2	"	"				"	
TP3	"	"				"	
TP4	"	"				"	
TP5	"	"				"	

Figure	Part No.	Description	Type	Remarks
TP6	513400027	Test Terminal	LC-1-G	
P20	513201203	Connector, Plug 12P	PC-1612	
P21	513400075	Connector, Pin Header 10P	HNC2-2.5P-10DS	
P22	513400062	" " 6P	HNC2-2.5P-6DS	
CNP	513201205	Contact Pin	PC-1600-111	x9 For P20
	513201207	Connector Lock	1600-LC	x2 For P20

6. SPECIFICATIONS

6.1 Recorder Specifications

Model	WX2300-1 (1 Pen)	WX2300-2 (2 Pens)
Recording area	A3 Size (381 x 254mm)	
Recording paper hold down	Electrostatic adhesion	
Pen	Disposable fiber-tip pen	
Circuit type	DC Servo	
Input type	Floating ground with guard	
Input resistance	1MΩ *	
Allowable signal source resistance	1kΩ or less*	
Accuracy	±0.25% of full scale* (Including deadband)	
Deadband	±0.1% of full scale*	
Common mode rejection ratio	DC 150dB and AC 140dB or better at maximum sensitivity	
Position adjustment	Pen position may be adjusted to any location within the full scale range*	
Sensitivity adjustment	2.5 times*	
Maximum allowable input voltage	500VDC (including common-mode voltage)	
Maximum pen speed	X=1500mm/s, Y=2000mm/s	X=800mm/s, Y_1, Y_2=1500mm/s
Maximum pen acceleration	X=3G, Y=5G	X=2G, Y_1, Y_2=4G
Pen lift response	10Hz	Y_1=10Hz, Y_2=5Hz

Model	WX2300-1 (1 Pen)	WX2300-2 (2 Pens)
Time sweep	Refer to Section 6.2	
External dimensions	483 x 440 x 162mm	483 x 440 x 176mm
Weight	Approx. 16kg	Approx. 17kg
Power consumption	Balanced: 30VA (Ave.) Not balanced: 135VA (max.)	Balanced: 30VA (Ave.) Not balanced: 145VA (max.)
Operating environment	0 ∿ 45°C, 30 ∿ 85% (RH)	
Power supply	100VAC ±10%, 50/60Hz, (or 115, 200, 220, 240VAC)	
Accessories	Instruction manual A3 Coated leaf paper (1 pack of 50 sheets) Pens WX2300-1 (5) WX2300-2 (5 each) Remote signal connector Input cables WX2300-1 (2) WX2300-2 (3) Dustproof vinyl cover 2A Fuses (2) Power cable	

Note: Items marked "*" apply when a Z-type amplifier is installed as the preamplifier.

6.2 Time Sweep Specifications

Method	Precision analog voltage integration
Ranges	0.02, 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10 cm/s (both X and Y axes)
Feed speed accuracy	±1% of full scale
Linearity	±0.3%
Control operation	X/OFF/Y Switching, RESET/START

6.3 Preamplifier Units

6.3.1 Voltage Measurement

Item \ Model	E Type	Z Type	L Type
Maximum sensitivity	0.005mV/cm	0.05mV/cm	0.5mV/cm
Measurement range (including multiplier)	0.005, 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2 (mV/cm & V/cm)	0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20 (mV/cm & V/cm)	0.5, 1, 2, 5, 10, 20, 50, 100 (mV/cm & x100mV/cm)
Switching accuracy (0.1V/cm reference range)	±0.25%		±0.45%
Input resistance	1MΩ fixed		
Allowable signal source resistance	1kΩ or less		
Sensitivity adjustment	Continuously adjustable between ranges		
Calibration voltage	Switched applied voltage is input corresponding to 10cm deflection		
Position adjustment	130% or greater of full scale	-300% ∿ +300% of full scale continuous adjustment	130% or greater of full scale
Bias voltage			
Input filter characteristics		Switch selectable: OFF, -20dB, -40dB	
Common mode rejection ratio	AC 130dB (50/60Hz), DC150dB	AC 140dB (50/60Hz), DC 150dB	AC (50/60Hz) 120dB DC (140dB)
Maximum allowable input voltage	500VDC (including common mode voltage)		

Item \ Model		Type T-1	Type K-1	Type PR-1	Type J-1	Type E-1	Type PT	Type TH	Type TL
Input sensor		T (CC) Thermocouple	K (CA) Thermocouple	PR Thermo-couple	J (IC) Thermo-couple	E (CRC) Thermo-couple	Platinum resistance thermometer	Special thermistor	
Measurement range (full scale)		-50 ∿ 50°C 0 ∿ 150°C 0 ∿ 300°C	0 ∿ 300°C 0 ∿ 600°C 0 ∿ 800°C 0 ∿ 1200°C	800 ∿ 1200°C 800 ∿ 1400°C 800 ∿ 1600°C	0 ∿ 100°C 0 ∿ 200°C 0 ∿ 400°C 0 ∿ 600°C		-50 ∿ 0°C 0 ∿ +50°C 0 ∿ +100°C 0 ∿ +200°C	0 ∿ 100°C	-50 ∿ 50°C
Accuracy	Linearization	±1%/FS					±0.5%/FS	±0.3%/FS	
	Room temperature compensation	±1°C (13 ∿ 33°C), ±2°C (0 ∿ 45°C)							
Position adjustment		-10% ∿ +60%/FS (250mm)	-10 ∿ +30%/FS				±20%/FS	Fixed	
Response		0.1s/full scale						4s/full scale	
Common mode rejection ratio		AC: 120dB (50/60Hz)							

Item \ Model	kL Type	KF Type	KD Type	KD-3 Type	KC Type
Input type	Logarithmic compression	F-V Conversion	AC Voltage	AC Voltage	DC Current
	DC & AC (rms) (10Hz ∿ 20kHz AC input)	AC 0.5Vp-p or greater	10Hz ∿ 100kHz sinewave	10Hz ∿ 100kHz sinewave	
Measurement range (/FS)	0.5V: 0.5mV ∿ 0.5V 5V: 5mV ∿ 5V 50V: 50mV ∿ 50V 500V: 0.5V ∿ 500V	20, 50, 100, 200, 500Hz 1, 2, 5, 10kHz	0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, 2 x1V, x100V	0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1, 3 x1V, x100V	0 ∿ 10mA full scale 0 ∿ 20mA full scale 4 ∿ 20mA full scale
Input resistance	1MΩ/10pF	100kΩ	1MΩ/10pF		10Ω
Calibration reference	0.5, 50V range: 0dB 5, 500V range: -20dB	10kHz	Full scale in each range		
Position adjustment	±20% of full scale	50% of full scale	120% of full scale	130% of full scale	+30, -10% of full scale
Linearity	±0.5dB (DC) ±1.0dB (AC)	±0.5%			
Drift (ripple)	0.3dB/12h, 0.3dB/10°C (-50dB)	1.5% (at 20Hz)	0.3%/10°C		0.5%/10°C
Response time (typ)	Risetime: 0.1s 20dB Falltime: 1s 40dB 3s 60dB	0.6s (full scale)	0.2s (full scale)		
Maximum allowable input	500VDC	200Vp-p	200V (rms)	300V (rms)	150mA

Special Notes

1. Requirements for Modifying the Input Panel

When using temperature units other than type TL or the E type unit, the input panel changes to accommodate the required conditioner.

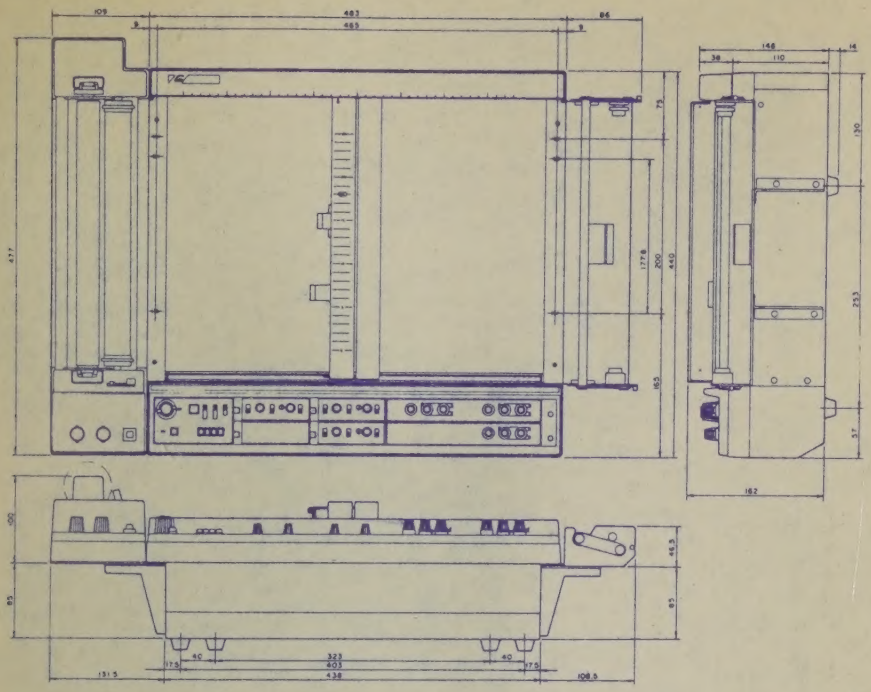
2. Full scale Definition

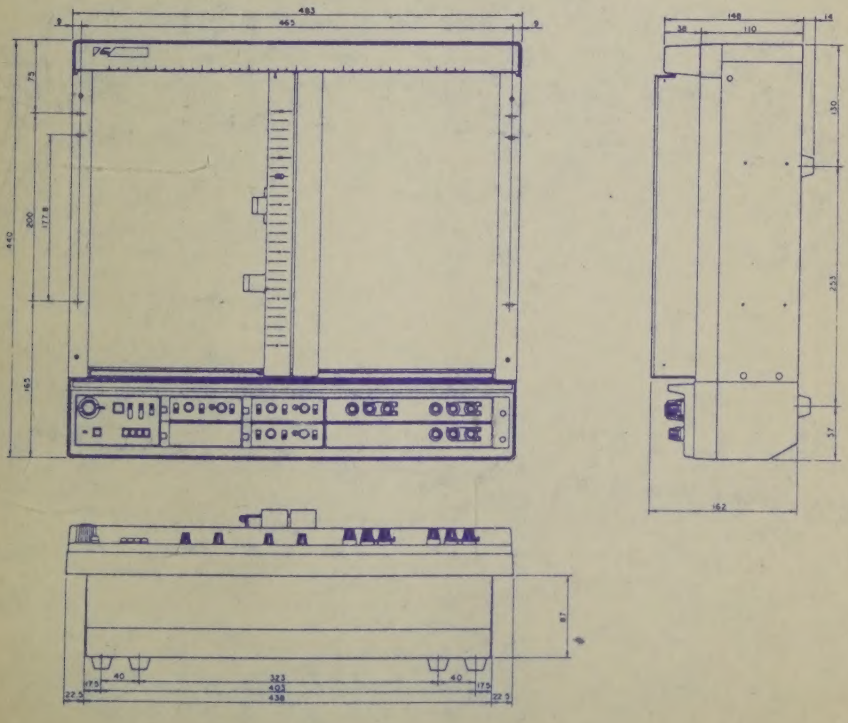
Full scale is defined as the deflection width of the X axis of the recording paper (250mm).

3. Sensitivity Indication

The sensitivity per unit cm or per 250mm is indicated for voltage units or other units, respectively.

7. OUTER VIEWS





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